Refrigeration Service Engineer

VOL. 13 NO. 12 ★ ★ ★ DECEMBER . 1945

NEW REFRIGERATORS GOING TO DEALERS •
REFRIGERANT PHYSICAL PROPERTIES •
FUTURE OF REFRIGERATION SERVICE •

THE REFRIGERATION SERVICE ENGINEER. Nickerson & Collins Co., Publishers, 435 N. Waller Ave., Chicago, 44, Ill. Published monthly. Vol. 13, No. 12. December, 1945. Entered as second class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Subscription in the United States, $2.00 per year; all other countries, $3.00 per year.

DRYING AUTOMATIC EXPANSION VALVES

No. 7 of a Series

Moisture in a refrigeration system may so permeate the valves that they may need to be dried separately.

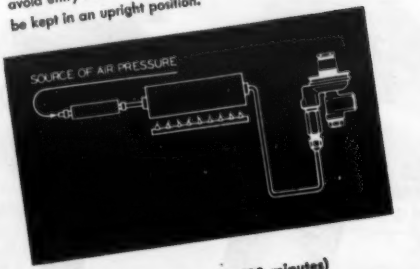
Detailed here are four effective methods of drying "Detroit" Automatic Expansion Valves—No. 672, 892 and 895.

When a No. 672 valve is heated it must be kept in an upright position so the dampening fluid inside the bellows shell will not escape. On No. 672 valves having a range of 0 to 50 psi, loosen adjusting spring completely. On No. 672 valves having a range of 25" vacuum to 25 psi, set adjusting screw at midpoint. Always remove the adjusting screw cap or rubber breather cap before dehydrating.

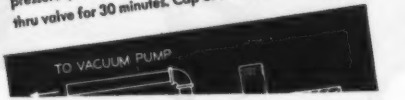
No.'s 892 and 895 valves may be dehydrated in any position. Remove adjusting screw cap and rubber gasket, and loosen adjusting spring completely before dehydrating.

Method No. 2 Atmospheric Oven (4 hours)
Use any type oven, but temperature regulation is absolutely essential to avoid damaging the valve.

Dehydrate 4 hours at temperature of 220° F maximum. Install or cap as soon as valve has cooled to avoid entry of moisture from air. No. 672 Valve must be kept in an upright position.



Method No. 3 Hot Dry Air (30 minutes)
Connect inlet of valve to source of hot dry air, under pressure (see sketch). Blow hot air (220° F maximum) thru valve for 30 minutes. Cap or install valve at once.



Space limitations prevent giving the full text of this service help on this page. The service bulletin illustrated here is complete. Write for your copy.

CONVENIENCE AND EFFICIENCY RECOMMEND THIS HENRY CARTRIDGE DEHYDRATOR

• Every trace of moisture can be removed from a Freon or Methyl Chloride refrigeration system and it can be kept moisture-free *conveniently* with this Henry Cartridge Dehydrator. The side outlet permits permanent installation of the dehydrator in a line. The flange shell construction affords easy replacement of cartridge. On new installations the dehydrant cartridge can be inserted AFTER the system has been pressure tested for leaks. Henry design, however, provides more than just operating conveniences — *it assures greater operating efficiency* because of the patented dispersion tube, dehydrant compression spring and distortion-proof flange, illustrated and described above. Available in a wide range of sizes with refill cartridges—with either Activated Alumina or Silica Gel. Cartridges are packed in moisture-proof containers.

Ask Your Jobber For A Henry Type 756 or 757 Cartridge Dehydrator — He Has It Or Can Get It For You.

HENRY VALVE COMPANY 3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

Refilling

IMPERIAL *TORPEDO* DEHYDRATORS

Fast, Simple and Easy as A-B-C

SIMPLY UNSCREW AND REMOVE THE CONNECTION AT OUTLET END OF DEHYDRATOR.
Note that on the Torpedo there are no bolts to remove—no flanges to take off.

SHAKE OUT OLD SILICA GEL, CLEAN DEHYDRATOR AND SCREEN, HEAT TO REMOVE MOISTURE, AND REFILL WITH NEW SILICA GEL.
No loose screens to contend with on Torpedo. Finger type monel metal screen—of welded construction—is integral with outlet connection so that screen and connection are removed at the same time. Dehydrator can be heated before refilling, if desired, because no soft solder is used in construction.

SCREW OUTLET END BACK IN PLACE.
No soldering required after refilling on the Imperial Torpedo Dehydrator. The job is done in short order.

YOUR BEST WEAPON IN THE WAR ON MOISTURE

Note These Other Important Torpedo Advantages:

One-piece streamlined shell provides greater strength, easier passage of refrigerant—has fewer joints.

Finger-type outlet screen provides more efficient filtering, less chance of clogging.

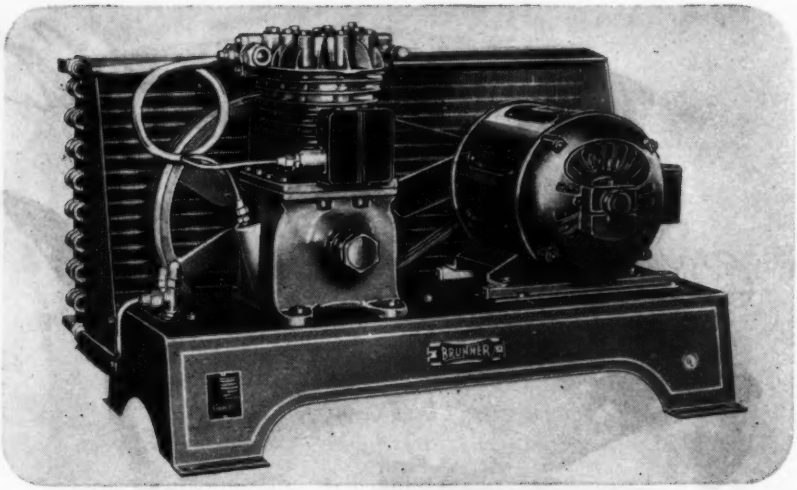
Copper and brass construction throughout.

Packed with Silica Gel.

IMPERIAL BRASS MANUFACTURING CO.
534 SOUTH RACINE AVE. • CHICAGO 7, ILL.

IMPERIAL

FITTINGS • VALVES • FILTERS • FLOATS
DEHYDRATORS • CHARGING LINES • TOOLS
FOR CUTTING, FLARING, BENDING,



It is the component of all parts that make the whole BRUNNER Condensing Unit...

Brunner's responsibility does not end with the precision and close tolerance manufacturing of the component parts of Brunner Condensing Units! It is our responsibility, as well as yours, to see that every Brunner Condensing Unit keeps operating for the longest possible span of life!

For that reason one of our basic principles is service! Service by the Brunner organization, Brunner Field Men, and their jobbers and dealers furnishing parts to you so that you, in turn, can render service that will keep Brunner Condensing Units *operating!*

We aim to maintain a stock of parts for every Brunner Condensing Unit now in service. Orders for parts are filled promptly to our jobbers and distributors, or to service men direct, at their request in an emergency. In the majority of cases service men can pick up parts most frequently in demand from the stocks of Brunner jobbers and distributors. Should the jobber or distributor be temporarily out of a desired part, he can procure it promptly from the factory. Should a unit replacement be necessary this can also be arranged by the jobber or distributor. If you have a servicing problem, Brunner factory representatives are available to assist you.

When ordering parts, remember to give the model and serial number of the unit as well as the part number, whether you order from the jobber or distributor or from the factory direct.

Brunner service will help your service keep Brunner Condensing Units serving!

BRUNNER MANUFACTURING CO.
UTICA 1, NEW YORK, U. S. A.

ARMY E NAVY
BRUNNER
FOR OVER 37 YEARS
THE SYMBOL OF QUALITY

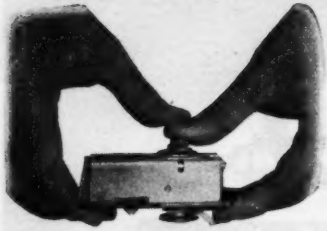
LOOK FOR THESE

Calibrated Dials
Independent adjustment of cut-in and cut-out pressures
Totally enclosed dust-proof snapswitch
Cold control adjustment
Tamper-proof cover
Capillary pressure connection

All these features are standard on Minneapolis-Honeywell Refrigeration temperature and pressure controls. Many others, especially designed to meet your individual requirements, are available. See your Honeywell branch or jobber for details. Minneapolis-Honeywell Regulator Company, 2934 Fourth Ave South, Minneapolis 8, Minnesota.

MINNEAPOLIS
oneywell
CONTROL SYSTEMS

UNUSUALLY *STURDY*
★SWITCH CONSTRUCTION



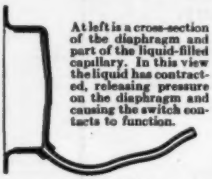
POSSIBLE BECAUSE OF THE SOLID-LIQUID CHARGE

Switches on White-Rodgers controls are so sturdy and strong that it takes all the pressure you can exert with *two* thumbs to make them click. The power of Hydraulic-Action is so great that it readily overcomes this resistance. Because of that power, White-Rodgers can and does build a better, *sturdier* switch into all its controls—a switch that is built to last.

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
★4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.

LIMITLESS POWER OF HYDRAULIC-ACTION ASSURES POSITIVE CONTACT



At left is a cross-section of the diaphragm and part of the liquid-filled capillary. In this view the liquid has contracted, releasing pressure on the diaphragm and causing the switch contacts to function.

CONTRACTED

Every part of White-Rodgers Hydraulic-Action controls is built stronger and *sturdier* because of the tremendous power of the solid-liquid charge. How this works is shown in these illustrations.

In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.

EXPANDED

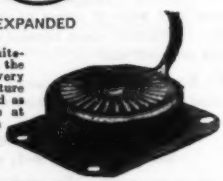
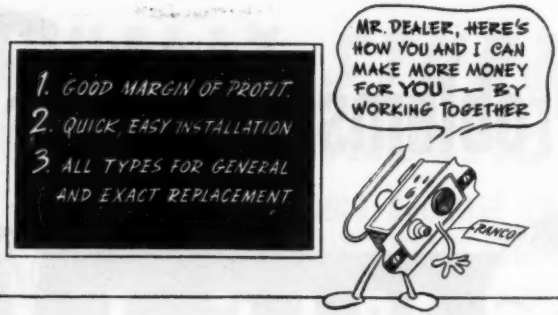


Illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert FULL pressure at the point of contact with the switch mechanism.

WHITE-RODGERS ELECTRIC CO.

1292C CASS AVENUE ST. LOUIS 6, MISSOURI

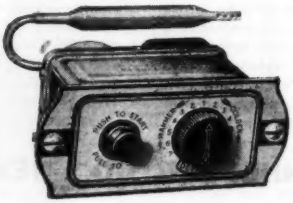
Controls for Refrigeration • Heating • Air-Conditioning



It's just simple logic . . .

You want your replacement work to be satisfactory to build consumer good-will; to keep present equipment operating until new units are available; to actually earn and deserve a fair margin of profit. When you install a Ranco Replacement Control you and your customer confidently expect precision, dependability and accuracy.

Your Ranco Jobber carries a more complete line of controls now than during the war; we are striving to increase this supply; but we ask that you accept your Jobber's recommendations when certain instruments are temporarily unavailable.



Ranco Inc.

COLUMBUS 1, OHIO

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Contents

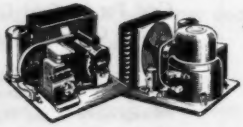
KELVINATOR CONDENSING UNITS

NOW

Competitively Priced

AND

Conveniently Warehoused



Increased facilities—production techniques developed during wartime—plus the adoption of certain basic merchandising fundamentals applied so successfully by Kelvinator in the household refrigerator field, have made possible this complete new sales-minded policy for Kelvinator Condensing Unit merchandising.

Production is now confined to a simplified, compact line of models that cover the requirements of the vast majority of commercial condensing unit users.

And Kelvinator's warehousing system has been expanded to 51 convenient distributor and branch points throughout the United States. Now Kelvinator trouble-free Condensing Units are available, competitively priced and conveniently warehoused. NASH-KELVINATOR CORPORATION, Detroit.

BUY KELVINATOR FOR YOUR COMMERCIAL REFRIGERATION REQUIREMENTS

Kelvinator CONDENSING UNITS

OPEN AND SEALED

IN THIS ISSUE—

A preview together with specifications and description of special features on the new refrigerators now going out to dealers displays is contained on pages 23 to 27. Included is a new make of refrigerator combining a three cubic foot freezer section. Other makes shown are the old manufacturers of prewar years.

Starting on page 28 is the second article in the series on Refrigerants—Physical and Refrigerating Properties. An interesting analysis of both the commonly used and less frequently used refrigerants, their advantages and disadvantages in various applications.

The fourth article in the series on the installation and operation of the Airtemp Conditioner starts on page 31. In this article the adjustment of the system is explained and some of the common troubles and their remedies are given.

The Warton School in England described on page 35 is another example of the efforts being made by our armed forces to give the G.I. training of a useful nature to him when he is released from the service. One of the several set up in European countries where American forces are on duty, the Warton School with an expected enrollment of 4000 offers training in nearly every common trade.

We have read and heard a great deal of the wonders to be expected in the postwar years, but the article on page 36 seems to be the ultimate in such dreams. If you are troubled with the current difficulties perhaps this article will appeal to you. At least it may provide a smile.

One of the Service Pointers on page 38 of this issue is an amusing story of one service call which in the final analysis proved to be a simple trouble with a simple answer. The peculiar actions of the unit, however, tend to lead the mind into baffling channels.

The Questions and Answers Department on Page 40 again offers some interesting problems and their answers on troubles encountered in the service field.

What of the future of refrigeration service was the subject of a town hall discussion at a recent meeting. The papers of the four speakers who expressed their views are reproduced on page 42.

An account of the Southwest Jobbers Annual Meeting and Luncheon and a report of the REMA fall meeting appears on page 52.

The long list of chapters in various stages of formation contained on pages 56 and 58 is evidence of the rapid growth of the Society. There are nearly 100 chapters and a total membership of over 5000 throughout the United States and Canada.

News from The Dispatcher this month on page 66 provides activities of service men and service companies.

Under New and Improved Appliances on page 68 are several interesting new tools and appliances. One a new grooving tool for plaster should also be useful in refrigeration work. Another, an adjustable capillary tube may be the answer to applying this type of refrigerant control to the different makes of refrigerators in the field.

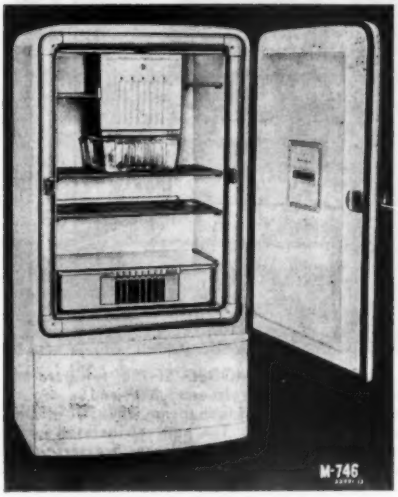
THE COVER

WHEN Sergeant Edmund E. Farr, of Terre Haute, Indiana, was in the combat zones in Europe, he served as a radio repairman with the 92nd Signal Battalion. Now he is a student in refrigeration at the Warton American Technical School in England and intends to combine his skill in both trades as a civilian. He has just finished installing the gauges and was purging a line when the photographer visited the shop. Sgt. Farr is one of 124 soldier-students who are enrolled in an eight-week course in refrigeration at Warton. See article on page 35.

First New Refrigerators Going To Dealers Floors

REFRIGERATOR production that will allow consumers to view and select models in dealers' stores, but no consumers deliveries in volume in time for "the family's Christmas present," seems to be the prediction of the average manufacturer as this showing goes to press.

Some of the first postwar makes and models which are now going out to dealers are illustrated and described on these pages. Perhaps the most noticeable and persistent change in these over the 1942 models is the emphasis on and increased space devoted to the storage of frozen foods.



THE NORGE REFRIGERATOR shown at right is the 1946 7 cubic foot M-746 and is one of the two first models to be announced. The other model M-746-A is identical in outside appearance but with fewer interior conveniences.

THE LEONARD HI-HUMID 9 cubic foot refrigerator has provisions for freezing and storage of 35 lbs. of frozen foods and 9 pounds of ice cubes, storing of foods with high moisture content and storing of average foods.

Leonard Refrigerators

New interior and exterior styling mark the new Leonards—three seven-foot models and one nine-foot model. The three seven cubic foot models are rolling from production lines, and the nine cubic foot model is anticipated soon.

The 1946 line is topped by the new Leonard Hi-Humid refrigerator, illustrated. The lowest-priced is the SL-7, the lead-off model, a seven-cubic foot unit with 12.2 square feet of shelf area; a freezer capacity of 24 pounds of packaged frozen foods and ice cubes.

The second model is the seven-foot L-7, which carries four additional features: the roomy vegetable crisper, a sliding meat chest with a capacity of 12 pounds, the five-way "Presto" and a 1¼ bushel vegetable bin.

Next in the line is the third seven-foot model, the DL-7, with double crispers topped by crystal-clear glass covers, 13.1 square feet of shelf area, and a freezer capacity of 30 pounds of packaged frozen foods and ice cubes.

Developments common to all models are: Freon-12 refrigerant; sealed condensing unit with a five-year protection plan.

THE GIBSON MODEL SF-796 refrigerator embodying a super freezer shelf and a moist chiller compartment occupying the full width of the refrigerator. The new refrigerator soon to be available will have larger freezers and chiller compartments.

Gibson Refrigerators

The new Gibson refrigerator features a freezing unit which extends the full width of the refrigerator. Larger than shown in the accompanying illustration, the new freezing compartment will be known as the freezer locker and will be completely surrounded by coils. It will be able to freeze foods as well as store them.

The moist chiller compartment directly below the freezer will also be larger and will provide temperatures just above freezing and humidities as high as 90%.

Claims made for this design are that the cold air dropping off the freezing unit across the entire width of the food compartment slows down circulation of the air and eliminates any great variation in food compartment temperatures.

Hotpoint Refrigerators

The first electric refrigerators since April 1942 off the Edison General Electric (Hotpoint) Appliance Co. lines at Erie, Pa., are two models, both having seven cubic feet capacity.

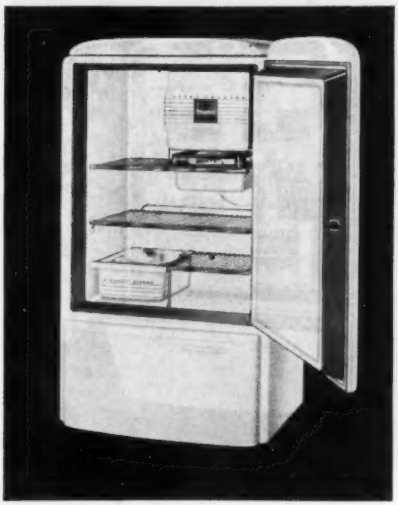
The first model off the line has "bright" trim, a "six-way" cold storage compartment, and humidity vegetable compartment; the other model is designed to sell at "lowest price."

The standard model is the Hotpoint Doric EB7 with 7 cubic feet capacity, and 13.4 square feet shelf area. It has a newly designed Hotpoint Thriftmaster unit, with increased power. The exterior is coated with double Calgloss enamel, with the interior a one-piece porcelain construction.

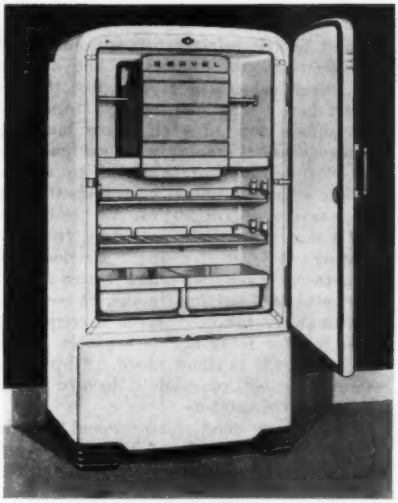
Equipment includes: pop-out ice cube trays, high humidity vegetable compartment drawer with heavy glass cover, one sliding shelf of heavy rust-resistant wire, and a six-way cold storage compartment. The over-all dimensions are: 59 inches high, 31 inches wide, and 28½ inches deep, including ventilation space and door handle.

The "economy" Hotpoint Doric model is similar in exterior trim, finish and dimensions, as well as in fundamental operating parts. It does not have the sliding shelf nor humidity storage drawer of the standard model.

A standard seven cubic ft. Hotpoint refrigerator at $188.00; and the lowest priced model at $151.50, both prices complete, delivered to consumers in any part of the nation, were announced as approved by OPA, by Edison General Electric (Hotpoint) Appliance Co. The prices are approximately the same as 1942 prices for these models.



THE HOTPOINT Standard Doric Model EB7 refrigerator. It has 7 cubic feet storage capacity and a shelf area of 13.4 square feet.



THE SERVEL model R-800 gas refrigerator. This is one of the five models the company is producing for its 1946 line.

Servel Refrigerators

The Servel 1946 line includes a total of five models—two deluxe models, the R-600 and R-800, and three standard models, the R-400-A, R-600-A, and R-800-A.

The R-400-A, the lowest priced model in the standard line, has a shelf area of 9 square feet and storage capacity of 4 cubic feet. It has 2 ice trays, one dessert tray with a capacity of 36 cubes.

The R-600-A has a shelf area of 11.98 square feet and storage capacity of 6.06 cubic feet. The ice cube trays and one dessert tray provide an ice capacity of 64 cubes.

The R-800-A has a storage capacity of 8.07 cubic feet and shelf area of 16.86 square feet. Seven ice cube trays and one dessert tray provide a total of 144 ice cubes.

In the deluxe line the model R-600 has a shelf area of 13.1 square feet and food capacity of 6.16 cubic feet. It is equipped with five ice trays and one dessert tray supplying 112 ice cubes.

The model R-800, illustrated, has a shelf area of 16.08 square feet, storage space of 8.07 cubic feet and is equipped with seven ice trays and one dessert tray providing 144 cubes.

Features of Servel line are flexible interiors to save time and space; temperatures and humidity for each different kind of food.

Frigidaire Refrigerators

Two models of the Frigidaire line are now coming off the production lines. First off the line is the model M 1-7, illustrated.

The M 1-7 super freezer has two double-width fast freezing shelves with self-closing door; two 2-pound and one 4-pound ice or dessert tray equipped with tray and cube release; total ice capacity is 8 pounds. The frozen food storage capacity is 705 cubic inches, plus 4 pounds of ice.

The meat tender is an opalescent glass, drawer type tray, 4¾" deep for storing meats. Has a capacity of 462 cubic inches. The Hydrator is a glass top drawer type with 550 cubic inch capacity.

The D 1-7 is a 7 cubic feet deluxe model with 15.1 square feet of shelf area. Four 2 pound and one 4 pound ice or dessert trays with tray and cube release have a capacity of 12 pounds of ice. Frozen storage is 705 cubic inches plus 4 pounds of ice.

The opalescent glass drawer type meat tender 4¾" deep has a capacity of 462 cubic inches. The defrosting tray serves as a cold storage tray for shallow articles such as extra ice cubes, and as a cover for the meat tender. It has a capacity of 118 cubic inches. The Hydrator has a 583 cubic inch capacity.

THE FRIGIDAIRE M1-7 containing 12 square feet of shelf space and 7 cubic feet storage space. It is equipped with meter-miser unit, baked enamel finish, meat tender and Quickube ice trays.

THE KELVINATOR MM-9 refrigerator in addition to new styling inside and out, reveals great emphasis on frozen food storage. This nine cubic foot Moist-Master is, in effect, a combination refrigerator and frozen food chest.

Kelvinator Refrigerators

The new Moist Master (illustrated) is in effect a combination refrigerator and frozen food chest. The new unit has a freezer capacity of 9 pounds of ice-cubes and 35 pounds of frozen foods. Its net capacity is nine cubic feet. For high moisture foods, the cold mist freshener employs cooling coils concealed in the walls of the cabinet surrounding the freshener.

Lead-off model of the 1946 series is the CS-7, the lowest-priced of the group. Incorporating all of the basic construction features, the seven-cubic foot unit has 12.2 square feet of shelf area, with a freezer compartment capacity of 9 pounds of ice cubes, and 20 pounds of packaged frozen foods. The next step upward in the line is to the C-7, a seven foot model with four additional features: the vegetable crisper, a sliding meat chest, with a capacity of up to 12 pounds, the five-way "Magic Shelf" and a 1¼ bushel vegetable bin. Next higher in the line is a third seven-foot model, the CD-7, which has double crispers with clear glass covers, 13.1 square feet of shelf space and a freezer capacity of nine pounds of ice cubes and over thirty pounds of packaged frozen foods.

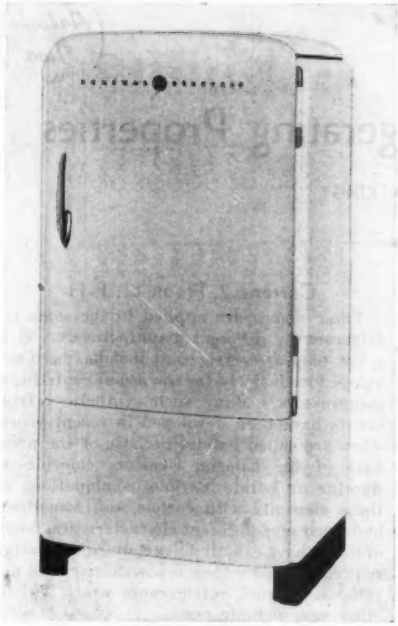
Westinghouse Refrigerators

First electric refrigerators now rolling off the Westinghouse production line are the B-7, seven cubic foot models, like the one shown here. The new refrigerators have 12.4 square feet of shelf space including storage capacity for frozen food packages and flexible shelf arrangement to accommodate eight full quarts of milk in the new space saving square bottles. Choice of several temperature controls ranges from defrosting to fast freezing. Sectionalized evaporators have two-quart frozen-dessert tray, plus facilities for freezing 84 ice cubes in a single operation. Vegetable crisper has glass top for inventory at a glance. Door latch responds to elbow touch. All-purpose storage for bottled goods is located in the bottom of the cabinet.

The frozen food compartment in the freezer or evaporator of the new refrigerator is two-thirds larger than in the last prewar model and will hold 10 pounds of frozen foods. Up to 15 pounds of meat can be stored in the vitreous enamel meat keeper. This pan slides under the freezer and is easy to remove when packed with meat.

The Westinghouse hermetically sealed unit is located in the bottom of the cabinet. Other models are to be put in production shortly.

THE WESTINGHOUSE B-7 refrigerator is a 7 cubic foot model with 12.4 square feet of shelf space. The freezing and storage space for frozen foods has been greatly increased.



GENERAL ELECTRIC refrigerator model LB7 has 7 cubic feet of storage space and 12.6 square feet of shelf area. It is finished in Glyptal baked enamel.

General Electric Refrigerators

In addition to the model LB7, illustrated, the General Electric line includes two more models. Refrigerator, Model JB7-D, a 7-cubic foot model with 13.4 square feet of shelf area. It makes 80 cubes, or 8 pounds, of ice. The refrigerator incorporates a hermetically sealed refrigerating mechanism. Entire operation of the appliance is controlled by a single knob. The stainless-steel Super-Freezer is mounted near the side of the cabinet, to provide the maximum amount of usable shelf area. A Tel-a-Frost indicator notifies the user when it is time to defrost. The cold storage compartment directly under the Super-Freezer provides low temperature with high humidity for preserving fresh meats. Vegetables are kept in a porcelain-finished drawer with a glass cover. Exterior of the cabinet is of durable high-luster Glyptal baked enamel; the interior is of durable porcelain.

Model LB6-H, a 6.1 cubic foot model with 11.8 square feet of shelf area. It makes 8 pounds of ice. The refrigerator mechanism is similar to the JB7-D's and the appliance also includes a side-mounted Super-Freezer and Tel-a-Frost indicator. The three shelves, which are not adjustable, are made of round tin-dipped steel wire welded to a steel frame. A glass chiller tray fiits directly under the Super-Freezer. The cabinet exterior is finished in Dulux, a liquid plastic; the interior is porcelain.

The New Frostor Refrigerator

TWO of the nation's best known manufacturers today announced their joint entrance into the electric refrigeration field.

The General Tire & Rubber Company, of Akron, and The Liquid Carbonic Corporation, of Chicago, in a joint statement, announced the formation of Frostor and the coming introduction of the first new combination refrigerator and freezing unit for the home.

The combination brings together General Tire's background of high manufacturing standards, exceptional dealer relations and public confidence, and Liquid's 45 years of experience in the commercial refrigeration field.

To produce the new Frostor, a million dollar factory is under construction at Morrison, Illinois. This building has been engineered specifically for the production of

(Continued on page 34)

FROSTOR, a new make of refrigerator, soon to appear on the market, is said to be the first combination refrigerator and home freezer

Refrigerants—

(Article Two)

Physical and Refrigerating Properties

By GUY R. KING*

TABLES III and IV combine the factors discussed in the November issue in an overall comparison of the various refrigerants.

To compare the list of requirements of a good refrigerant with the properties of water would seem to make a very poor refrigerant of this common fluid. The enormous volume of its vapor at required evaporator temperatures is such that the use of an ordinary compressor is impossible. High vacuums are required in both the low and high pressure sides of the system. The required vacuum on the low side is so high that it is difficult to maintain. Leaks are difficult to find. Their only evidence is when air leaking into the system prevents proper operation. To check for a suspected leak the system must be charged with compressed air and all points tried with soap suds. The 32° freezing point makes it impossible to use it for ordinary applications.

However, for certain applications above 32° such as chilling large quantities of water and for air conditioning, it has satisfactorily filled some very rigid requirements. First, it is absolutely safe. It has no odor or poisonous properties, and it is not inflammable. If any amount of it were accidentally released in a crowded building, it would not cause panic.

The problem of handling the excessive volume of the low pressure vapor has been solved by the development of centrifugal compressors and steam ejectors, either of which will easily handle large volumes of vapor at low pressure. The steam jet system using water as a refrigerant has been used extensively in the air conditioning of passenger trains. Its lack of hazard and availability, plus the absence of mechanical compression equipment, make it a very desirable refrigerant where the rough service of railroad conditions makes leaks more probable than in stationary systems.

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Carrene 2, Freon 11, F-11

These names are applied to the same refrigerant by different manufacturers. It is a low pressure refrigerant that has been developed exclusively for the use of centrifugal compressors. Many such synthetic refrigerants have been developed in recent years. They are called halides because of the presence of the halogen elements chlorine or fluorine or both. Various combinations of these elements with carbon and sometimes hydrogen give different characteristics, many of which have exactly fit certain refrigeration reqirements. Further research may well develop more such refrigerants which will fit other very definite needs.

These halides are somewhat similar to ether. Carrene 2 (Freon 11) has a sweet ethereal odor. Both the liquid and the vapor are clear and colorless. The liquid is quite heavy, having a specific gravity of 1.57 at 5°. This means it is about one and one half times as heavy as water. The vapor has a specific gravity of 4.85 at atmospheric pressure. This makes it nearly 5 times as heavy as air. With such a heavy, dense liquid and vapor, pipe lines, passages in compressors, and valve openings must be of liberal size, and have a minimum of bends or other restrictions. Otherwise excessive pressure drops would occur.

Its boiling temperature at atmospheric pressure is 74.7°. Thus it must be operated at a vacuum to produce refrigeration temperatures. Because of its high boiling point, it can be shipped in drums similar to oil drums. The low pressure (vacuum) and large volume of this refrigerant make it well suited to the characteristics of the centrifugal compressor. This eliminates the pressure and volume difficulties listed as disadvantages in the first three items of Table I.

It will mix with oil in any proportion and thin out the oils, as do all halogen refrigerants. Compression equipment particularly centrifugal compressors can be designed with

TABLE III.—REFRIGERATING PROPERTIES OF COMMON REFRIGERANTS

	Water	Carrene 2 Freon 11	Sulphur Dioxide	Methyl Chloride	Freon 12	Ammonia	Freon 22	Carbon Dioxide
1. Maximum Refrigeration per cu. ft.	Poor[1]	Poor[1]	Poor	Fair	Good	Good	Good	Good
2. Reasonable Condensing Pressure	Poor	Good	Good	Good	Good	Good	Good	Poor
3. Reasonable Evaporating Pressure	Poor	Poor	Fair	Good	Good	Good	Good	Poor
4. Stability	Good	Good	Good	Good	Good	Good	Good	Good
5. No Effect on Metals	Good	Good	Good	Good	Good	Good	Good	Good
6. No Effect on Oil	Good	Fair	Good	Fair	Fair	Good	Fair	Good
7. High Critical Temperature	Good	Good	Good	Good	Good	Good	Good	Poor
8. Non-Poisonous; Non-Irritating	Good	Good	Poor	Poor	Good	Poor	Good	Good
9. Non-Inflammable	Good	Good	Good	Poor	Good	Poor	Good	Good
10. Availability; Cost	Good	Fair	Good	Fair	Fair	Good	Fair	Good
11. Ease of Finding Leaks	Poor	Fair	Good	Fair	Fair	Good	Fair	Poor
12. Power Required	Good	Good	Good	Good	Good	Good	Good	Poor
13. Freezing Point	Poor	Good	Good	Good	Good	Good	Good	Fair

[1] Except for use with centrifugal compressors.

TABLE IV.—REFRIGERATING PROPERTIES OF SOME OTHER REFRIGERANTS

	Carrene 1	Methyl Formate	Ethyl Chloride	Thermon Zeon Freon 21	Freon 114	Butane	Isobutane	Propane
1. Maximum Refrigeration per cu. ft.	Poor[1]	Poor	Poor	Poor	Poor	Poor	Poor	Good
2. Reasonable Condensing Pressure	Poor	Poor	Good	Good	Good	Good	Good	Good
3. Reasonable Evaporating Pressure	Poor	Poor	Poor	Poor	Poor	Poor	Fair	Fair
4. Stability	Good	Poor	Good	Good	Good	Good	Good	Good
5. No Effect on Metals	Good	Good	Good	Good	Good	Good	Good	Good
6. No Effect on Oil	Fair	Good	Poor	Fair	Fair	Fair	Fair	Fair
7. High Critical Temperature	Good	Good	Good	Good	Good	Good	Good	Good
8. Non-Poisonous; Non-Irritating	Good	Poor	Good	Good	Good	Good	Good	Good
9. Non-Inflammable	Fair	Poor	Poor	Fair	Good	Poor	Poor	Poor
10. Availability; Cost	Fair	Poor	Fair	Fair	Poor	Good	Good	Good
11. Ease of Finding Leaks	Fair	Poor	Fair	Fair	Fair	Poor	Poor	Poor
12. Power Required	Good	Good	Good	Good	Good	Fair	Fair	Poor
13. Freezing Point	Good	Good	Good	Good	Good	Good	Good	Good

[1]Except for use with centrifugal compressors.

this in mind, and most of the difficulties that might be encountered with such a condition eliminated.

It will dissolve any natural rubber material, so this must be kept in mind when selecting gaskets. Synthetic, oil resisting rubber will hold it.

Leaks in the high side may be checked with a halide torch. If there is a leak in the low side, a charge of air must be added to bring the pressure above atmospheric. A mixture of air and refrigerant escaping from a leak will still be indicated on the halide torch.

It satisfactorily fits all other requirements of a good refrigerant listed in Table III. It is ordinarily safe, being non-toxic and non-inflammable. It will break down to toxic compounds in a flame. Its freezing point or critical temperature impose no limitations on ordinary requirements. It is available through two different manufacturers, although its price is high. Its horsepower requirements are among the lowest.

It was originally developed for air conditioning work, which required a safe refrigerant. It still has a wide-spread use in this application. It has also been adapted to many industrial jobs, mainly where safety is paramount. Many Maritime Commission refrigerated ships have been equipped with it.

A centrifugal compressor cannot be built in small sizes, so cannot be used on domestic or commercial applications. This does not mean that this refrigerant cannot be used on such applications, since refrigerants with similar characteristics have been used with rotary compressors. However, such applications have been limited, and there is no reason for them to be any more popular. Therefore, little, if any use of this refrigerant may be expected in small applications in the future.

There may well be an increase in its industrial use, particularly in large sizes. The larger the size or capacity of the required system, the greater is the advantage of the centrifugal compressor. Any increase in this type of compressor will of necessity increase the use of the refrigerant best suited to it.

Sulphur Dioxide

This is the gas obtained by burning sulphur, and that is the way most of it is made commercially. It is easily recognized by its sharp, irritating odor. The pure liquid is clear and colorless, but if it escapes in liquid form, it will absorb enough moisture and oxygen from the atmosphere to turn it yellowish. The vapor is colorless. The liquid has a specific gravity of 1.47 so is about one and one half times as heavy as water. The vapor has a density of 2.56 at atmospheric pressure. Its boiling point at atmospheric pressure is 14° F.

The volume of sulphur dioxide is large compared to other common refrigerants, but not so large that a reciprocating compressor cannot be used. A vacuum is necessary for an evaporator temperature below 14° F. The head pressure is low.

Corrosive and Irritating

It is highly corrosive if water is allowed to enter the system.[1] It can be purchased pure and dry, and it must be kept that way. Any air entering the system will contain atmospheric moisture. This can very easily happen if the system is operating at a vacuum with a leak on the low side, even a small shaft seal leak. Oil left open to the air may absorb moisture enough to cause damage when used in a system with sulphur dioxide. Corroded and sticking expansion valve needles and gummed up compressor valves are the least to expect with moisture in a system. And pistons frozen in cylinders are not uncommon. It is well to remember, though, that moisture in any system will cause some corrosion, besides freezing out at the expansion valve and plugging it with ice. So with sulphur dioxide, the damage caused by moisture is only more sudden and more severe than with other refrigerants.

Sulphur dioxide is highly irritating and toxic. It is so irritating that one will not stay in it if he is physically able to get out. It is non-inflammable. It is one of the cheapest refrigerants available.

It gives no lubrication problems if oil used is properly refined and has been kept clean and dry. Only a small amount of refrigerant can be dissolved in the oil. Since the refrigerant is so heavy, the oil floats on top of it like on water.

It is very easy to find leaks. First, the odor gives instant warning. Second, SO_2 forms a dense white smoke when it comes in contact with ammonia. Sufficient ammonia is easily obtained from a small swab on the end of a stick or wire which has been dipped in a solution of industrial aqua ammonia. If this is held near the suspected joint, a white smoke, apparently coming from the leak is positive indication.

(Continued on page 34)

[1] Sulphur dioxide plus water gives sulphurous acid. If oxygen (in air) is present, the sulphurous acid may oxidize to sulphuric acid.

Installation and operation of (Article Four)

Airtemp Conditioners

SERVICE DIAGNOSIS

Will Not Start

REMOVE the compressor access door and check the characteristics of the compressor motor nameplate to see that it agrees with the available power supply. If so, press in on the front of the magnetic starting switch for a few seconds and then release it. If the compressor does not start, investigate:

(a) *No Current*—Use a test lamp and test for no voltage. This may be due to a temporary interruption of power, a blown fuse or a loose terminal in the line voltage circuit. Determine the reason and correct it.

(b) *Damaged Compressor Motor*—If there is voltage at the compressor motor terminals in the compressor terminal box, and the compressor will not start, the fault lies with the compressor motor and compressor must be replaced.

The capacitor, transformer and relay on single phase units should be tested as follows:

1. Connect an ac voltmeter (250-volt scale) across terminals of relay holding coil. When compressor switch is turned on and compressor operates normally, the voltmeter will show a gradual increase in voltage across the relay coil from (0 to 160 volts, Westinghouse Motors)-(0 to 190 volts, Century Motors) and the relay will transfer from starting to running contacts at approximately (125 volts, Westinghouse)-(105 volts, Century).

2. Low voltage at this point or blowing of line fuses, indicates one of two sources of trouble, either the winding of the compressor motor is grounded or shorted, or, the capacitor and transformer assembly is at fault. Disconnect the red wire of the compressor cable at the relay. Turn the switch to starting position and if voltage does not rise to near normal, the capacitor and transformer must be removed and tested separately.

3. If necessary, remove the capacitor and disconnect the sections so they can be tested separately with a test lamp by charging the capacitor first, then discharging it by shorting the terminals with an insulated handle screw driver. A good unit will show a discharge when shorted in this manner and if the capacitor under test will hold a charge for at least one minute, it is in good condition.

If the compressor starts when the magnetic starting switch is closed manually, investigate:

(a) *Resets*—Press in on the reset button or buttons and release slowly.

(b) *Overload Heater Coils Damaged*—If either of the overload heater coils are damaged or broken, it must be replaced with a new one.

(c) *Low Voltage Contacts Open*—This may be due to:

1. Thermostat Set Too High—Turn the switch to the right or to a "colder" position.

2. Low Pressure Control—If the low pressure control is breaking the low-voltage circuit, it may be due to a shortage of Freon, a stuck-shut expansion valve, incorrect control setting, or a damaged control and it may be necessary to add Freon, replace the expansion valve, or reset the low-pressure control.

3. High Pressure Control—If the high pressure control is breaking the low voltage circuit, it may be due to stoppage, high temperature, or interruption of the condensing water; incorrect water valve setting, incorrect control setting, air in the system or a damaged low-pressure control. It may be necessary to investigate the water supply, water valve and water-valve setting, reset the low-pressure control, purge air, or replace the low-pressure control.

If the above parts are in good order, further investigation will include:

(a) *Low Voltage Transformer*—Swing out or loosen the control panel and use a test lamp at both the primary and secondary leads on the transformer. If it is at fault, it must be replaced.

(b) *Magnetic Switch-Holding Coil*—Test for voltage at both sides of the holding coil and if it is at fault, it must be replaced.

(c) *Fan and Compressor Switch*—Use a test lamp to see that the contacts just back of the switch are making and to see that the switch is not at fault or turning. If the switch is at fault, it must be replaced.

Runs But Does Not Cool

Attach an oil pressure gauge, suction pressure gauge and discharge pressure gauge, then investigate:

(a) *Freon Charge*—

(b) *Expansion Valve*—A stuck-open expansion valve will cause a reduction in the amount of cooling produced. This condition is accompanied by a cool or cold crankcase and the expansion valve should be replaced.

(c) *Fan and Fan Motor*—See that air is being drawn into and discharged from the conditioner. If not, it may be due to a loose or damaged belt, loose fan or motor pulley, damaged fan motor, or overload protection switch, and the part at fault must be adjusted properly or replaced.

(d) *Filter*—See that the air filter is not so clogged with dust and dirt that it impedes the flow of air into the conditioner. If it does, it must be replaced with a new filter. See Operating Instructions attached to the conditioner.

(e) *Oil Pressure*—The oil pressure should be at least 20 pounds above the suction pressure when the conditioner has been operating five minutes or longer. If the oil pressure is the same as the suction pressure and there is no indication of oil leakage on the compressor or oil cooler, the compressor must be replaced.

If there is indication of oil leakage, add one pint of oil to the compressor. Operate the compressor several minutes and if the suction and oil pressure are still the same, the compressor must be replaced.

(f) *Oil Separator*—Observe the temperature of the oil return line between the oil separator and the compressor crankcase. If the line is near the room temperature it is normal. If the line is hot, it indicates that discharged gas is leaking past the oil return float and the oil separator must be replaced.

(g) *High Discharge Pressure*—Attach a discharge pressure gauge and see that the operating discharge pressure is not excessive. If the discharge pressure is higher than 150 pounds, check the condenser cooling and possible air in the system.

See if there has been a change in the heat load of the conditioned area such as open doors, or windows, increased light load, number of persons, or quantity of fresh air introduced. It may be necessary to measure the quantity of air being handled as well as the entering and leaving wet and dry bulb temperatures of the air being handled to demonstrate that the conditioner is doing the correct amount of cooling. To check the tonnage, determine the exact amount of water used in gallons per minute, with the compressor operating at 120 pounds discharge pressure. Take the temperature of the inlet water and the outlet water to determine the temperature rise. Proceed as outlined in the example below:

27° temperature differential $\times$ 3 gallons of water $\times$ the factor .036 = 2.91 tons.

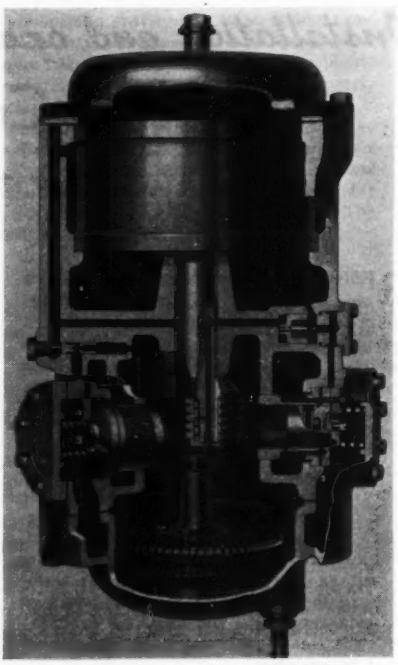

Fig. 8. Cut-away view of the AHC-5 motor-compressor unit.

Starts and Stops Frequently

Attach a suction pressure gauge and discharge pressure gauge to the compressor and investigate the operation of the *thermostat, low pressure control,* and *high pressure control.*

Conditioner Noisy

It is very difficult in many cases to determine the actual source of this condition. It should also be kept in mind that noise is relative and what is disturbing to one person may not be to another. The chief causes of complaints from noise are usually:

(a) *Belt*—The fan and motor pulleys must be in line and the belt must have the proper tension. A bent fan shaft, or marred pulley may cause noise.

(b) *Fan Bearings*—Improper lubrication or excessive belt tension may cause the fan bearings to wear excessively and become noisy.

(c) *Fan Shaft*—Too much end play in the fan shaft may cause vibration or allow the fan to rub the housing and can be corrected by properly spacing the collars on the shaft.

(d) *Loose Grilles or Panels*—All access panels and grilles should be tight and properly put in place.

(e) *Water Valve*—Under some conditions usually in connection with very low water usage or high water pressure, a water valve may be subject to a high pitched hum and if it cannot be corrected by adjusting the amount of water slightly, the water valve should be replaced.

(f) *Conditioner Not Level*—The conditioner must be leveled.

(g) *Weak Supporting Floor*—This can sometimes be remedied by placing a pad of isolation cork under the conditioner.

(h) *Relay*—(Single Phase) Chattering of this relay is usually due to low voltage, or poorly aligned contacts on the relay or magnetic starting switch. Low voltage may be due to the power generating or distributing equipment or to improper wire sizes.

The running contacts should be in line and about 1/16 inch from making when the hard rubber point is touching the bar containing the starting contacts. The contacts on the magnetic starting switch must be in line and not arcing. Never start the conditioner after a period of operation until the compressor has had a chance to unload, usually 1 to 2 minutes. Otherwise the relay may chatter. Normally, the relay will close only once on starting and the noise of the relay closing cannot be eliminated. If the relay continues to chatter, it must be replaced.

Fan Will Not Start

Turn on the fan switch and investigate:

(a) *No Current.*

(b) *Protection Switch*—Check reset button and determine cause of overload.

(c) *Damaged Fan Motor*—Test for voltage at the fan motor terminals. If there is current and the fan motor will not start, the fan motor terminals must be investigated or the fan motor must be replaced.

(d) *Frozen Bearing*—Remove the fan access door and rotate the fan wheel by hand. If it cannot be turned, it may be due to the fan wheel striking the fan housing or a frozen bearing, and it may be necessary to center the fan wheel on the fan shaft or replace the fan bearings.

REMOVING AND REPLACING PARTS

Capacitor

To Remove the Capacitor:

1. Open the main disconnect switch.
2. Loosen or swing the control panel to one side.
3. Disconnect the wiring to the transformer and tag the wires for identification.
4. Remove the two bolts from the supports on the left side of the transformer. Loosen the two bolts on the right end of the transformer and slide the transformer to the left, away from the bolts.
5. Turn the transformer on the support plate and remove it.
6. Remove the metal strap at the right side of the capacitor support.
7. Move the capacitor to the right, into the space which was occupied by the transformer.
8. Disconnect the wires and tag them for identification.
9. Turn the capacitors on the support plate and remove them between the angle iron brace and the capacitor housing frame.

Compressor

To Remove Compressor (in case compressor motor will not operate):

1. Attach a suction pressure gauge and close the suction and discharge shut-off valves on the compressor.
2. Remove the ⅛ inch pipe plug from the gauge adapter, attach a connector, (⅛ inch pipe x ¼ inch flare) and run a ¼ inch copper tube to a window.
3. Open the gauge adapter and discharge the Freon in the compressor until the suction pressure gauge registers 2 to 3 pounds.
4. Close the gauge adapter, disconnect the copper line, remove the gauge adapter and replace the ⅛ inch plug in the suction pressure gauge connection.

5. Remove the compressor as described in steps 6 to 15 inclusive, below.

To Remove (in case the compressor will operate):

1. Attach a suction pressure gauge to the compressor and close the liquid shut-off valve.

2. Close the discharge shut-off valve and then open it two or three full turns.

3. Block the low pressure control shut with a small wood block. NOTE: This is not necessary on 3-SCBX conditioners after Serial No. 2601.

4. Start the conditioner and operate it until the suction pressure gauge indicates approximately 15 inch vacuum. Stop the conditioner and quickly close the discharge shut-off valve.

5. Wait a few minutes, then observe the suction pressure gauge. If it indicates any pressure above 2 pounds, it must be "pumped down" again. If the gauge shows below 2 pounds pressure, open and close the liquid shut-off valve slowly until the suction gauge shows 2 pounds pressure.

6. Open the main disconnect switch.

7. Loosen the suction shut-off valve from the compressor body by taking out the four Allen screws.

8. Loosen the discharge flange by taking out the four screws. Provide a clean pan for catching oil in case lower drip pan is plugged.

9. Disconnect the high pressure control tubing at the discharge header.

10. Remove the compressor terminal box cover plate.

11. Disconnect the wires to the compressor motor terminals, tagging them for identification.

12. Loosen the connector at the compressor terminal box and pull the cable out of the opening.

13. Disconnect the two rubber hose from the top and bottom of the oil cooler.

14. Take out the cap screws in the top support plate and slide the compressor body forward. Place a piece of clean cloth in the suction valve opening and in the discharge flange opening in the compressor.

15. Lift out the compressor body and lay it on its side on a canvas or rubber mat until the new compressor is put in place, then place it in the new compressor shipping crate. NOTE: Do not rest the weight of the compressor on the conditioner drain pan and be careful to avoid damaging the floors or furnishings near the conditioner.

(To be continued)

NEW FROSTOR REFRIGERATOR

(Continued from page 27)

the first really new refrigerator, combining seven cubic feet of cooling space with three and one-half cubic feet of frozen storage.

There are three kinds of cold in Frostor. The normal food storage compartment is kept constant at forty degrees. This compartment has 14.2 square feet of shelf space. The frozen food storage locker is maintained at zero. The ice making section, located between the two compartments, is kept at subfreezing.

Entirely encircled by chilling coils concealed in the walls, also a departure from conventional designs, Frostor provides cold sleeve cooling which keeps air nearly 90 per cent full of moisture, thus eliminating dehydration and keeping vegetables crisp and fresh.

The inclosed coils also eliminate the necessity for frequent defrosting, this nuisance being almost entirely done away with. Defrosting of the refrigerator compartment never will be necessary.

REFRIGERANTS

(Continued from page 30)

Power requirements are as low as for any of the other refrigerants, and lower than some.

To review, SO_2 makes an excellent refrigerant except for its large volume and certain hazards. The hazards it does have give instant warning due to its pungent, irritating odor. Because of its other good qualities, it has been widely used in domestic and small commercial systems. It was the first refrigerant to successfully replace ammonia in small size equipment. In this class of service the larger volume of sulphur dioxide is not a disadvantage, because of the small amount of refrigeration needed. A small compressor will handle sufficient of even this refrigerant to do the required job. Particularly with domestic units, it is an advantage because such refrigerants as ammonia produce so much refrigeration that it would be difficult to control accurately in the small quantities required.

But the toxic properties of sulphur dioxide have been against it. Methyl chloride and Freon 12 have largely displaced it in commercial equipment. Some manufacturers tried methyl chloride in domestic systems, later to give it up for Freon 12. Whether this latter refrigerant will entirely displace it in the future, time only will tell, but the trend is that way.

(To be continued)

Warton School in England
Trains Men of U. S. Army

A COMPREHENSIVE course in theoretical and practical refrigeration at the Warton American Technical School in England has attracted a student body of 124 enlisted men and officers of the United States Army, who intend to pursue the business in civilian life.

Only ten per cent of the enrollment are experienced refrigeration men, but many of the beginners have been trained in radio repair and they hope to combine the trades as their post-Army occupation. Three of the enlisted men are Negroes. Warrant Officer Harry M. Bailey, former refrigeration mechanic and serviceman for the Coca-Cola Bottling Company in Oswego, New York, who is serving as chief of the section at Warton, said that each student will be a qualified serviceman when he completes the study.

Mr. Bailey reported that each student is applying himself conscientiously and taking full advantage of the opportunities offered to utilize his time profitably while awaiting shipment to the United States for eventual discharge. Each "graduate" will receive a certificate of successful completion. "I know I wouldn't be afraid to hire any of them," Mr. Bailey stated confidently.

8 Weeks Course Offered

The course is only eight weeks in duration, but it is the equivalent of an eight-month semester in a vocational school in the United States. In the first six weeks the student tore down the compressor, condenser, receiver and cooling unit, and acquainted himself with each part under the supervision of capable instructors. He studied tube bending, flaring and pinch-off; made his own cooling coils, completed an installation on a work bench, charged and discharged the unit with gas, and installed the machine in a box. He also received lessons in multiple installations. The 80-hour week in the shop included two hours of classroom theory and four hours of practical work each day.

Then, during the final two weeks of the course, the soldier-students went "trouble shooting." Units were put out of order by instructors and the pupils made the repairs after analyzing the mechanical disorder. The class also was segregated into eight groups which serviced refrigeration installations on the post.

The lesson plan is outlined as follows: Compression system, refrigeration installation, absorption system, conventional domestic compression of cycle-refrigerators, domestic rotary and hermetic compression of cycle-refrigerators, domestic absorption refrigerators, domestic automatic refrigeration controls, domestic refrigerator electric motors, domestic refrigerator servicing, refrigerator service shop and tools, commercial refrigeration installing and servicing, and refrigerants.

Thoroughly Equipped

The course at Warton is based on a textbook entitled "Modern Electric and Gas Refrigeration," which was published by the United States Armed Forces Institute. The equipment, valued in excess of $50,000, includes 18 units consisting of compressors, condensers and receivers; 18 units consisting of compressors, condensers, receivers and motors; 23 different types of household refrigerators as small as 4 cubic feet; 28 walk-in coolers as large as 216 cubic feet; 2 ice-flaking machines; spare parts, tools and equipment to maintain the units and for instruction. In addition, the section's machine shop is equipped with 2 lathes, 4 bench grinders, 2 drill presses and other tools.

The teaching staff consists of eight civilian technicians, who came to Warton directly from the United States, and four qualified enlisted men. Howard E. Degler, chairman and professor of the Mechanical Engineering Department, University of Texas, serves as co-ordinator of instruction. Among the civilian instructors are Thomas W. Poplin, Wilmington, North Carolina, veteran refrigeration service engineer, who has taught Army engineers for the last four years, and Joe B. King, Kansas City, Missouri, a distributor with 18 years of experience in the trade.

(Continued on page 37)

A Trip Through Deep Sleep

ROBERT E. (BOB) SAUNDERS newly elected secretary of the Illinois State Association R.S.E.S. and engineer in the research department, Oil-O-Matic Corp., Bloomington, Ill., had just completed a very busy and highly successful year. What with the usual wartime difficulties of labor shortages, material troubles, long hours of work and little play made doubly hard because of the new position and its attendant responsibilities taken on about a year ago; and being elected secretary of the State R.S.E.S. group. Yes, it was a busy year.

Bob had done an outstanding job of his secretarial work, so much so, that he had just been reelected secretary for another year; he had won a promotion in the company by whom he was employed and his circle of friends had multiplied several times.

But Bob was tired as he sat in the meeting at Bloomington which earlier in the day had reelected him secretary. He had much to contemplate. A year ago he had been fresh and eager—but hard work will take its toll. He felt the need of rest—but in its stead—another year of the same thing lay ahead of him. Plans to be made, programs to map, reconversion, continued labor shortages, high prices and strikes to slow your efforts. If one could only go away and forget it all until everything had settled down.

Bob was watching a movie at the moment —a part of the meeting program he had helped to arrange. The meeting room was dark, his eyes smarting from the smoke laden air. The movie was a beautiful scene in color, of postwar expectations, so real in its portrayal that one could almost smell the flowers along the peaceful green countryside when suddenly looming into view came this sign:

One mile to—

DEEP SLEEP INC.

Do you have troubles?
Don't you like the party in power?
Are you bored with things today?
Would you rather live 200 years from now?

Let DEEP SLEEP Help You

See Attendant for Information

The sign passed from view but its interesting message lingered. Such an intriguing thought and how appealing to those overworked harassed souls of these war years. Came another sign!

One half mile to—

DEEP SLEEP INC.

Sleep with the famous
Enjoy life 200 to 2000 years from now
At our risk
Refrigerated Sleep that is Guaranteed!
—or else!

See attendant

Another enticing thought! Apparently he was approaching the home of Deep Sleep Inc. Sleep! that's what Bob needed—sleep and rest. He had not had enough of it lately and here was an opportunity to get 200 years of it.

Approaching the building Bob entered and was met by an attendant.

"How do you do! Are you interested in Deep Sleep?"

Bob acknowledged he was.

"Deep Sleep," explained the attendant, "is an international institution founded for the purpose of preserving life for a future generation through the process of suspended animation."

"There are many of us who are dissatisfied with present conditions and who would welcome the chance to go to sleep—a peaceful undisturbed slumber—with the assurance that we would be awakened 200 or more years from now. Imagine all the conveniences and privileges one might enjoy—all the surprises which would be in store. Have you thought what it could mean to you?"

"Yes, I have," said Bob, "and just now I need sleep—a lot of sleep."

"You are now in the reception room of Deep Sleep, Inc.," continued the attendant, "and we would like you to make yourself at home with us while these beautiful young receptionists show you through the halls of Deep Sleep."

Bob had the vague feeling of floating through space as he was taken in hand by the receptionists. Their youth, charm and effeminate gentleness so much reminded him of the fleecy white clouds he once found time, as a boy, to watch floating across a clear blue sky. As they progressed one of the receptionists explained—

The Halls of Deep Sleep

"These are the halls of Deep Sleep. The rows of doors before you lead to inner doors which lead to other inner doors and they to another and so on to the sealed chamber in which the guest sleeps, until awakened at a later date which he himself has specified. They are rooms within rooms, each insulated and soundproofed, shutting out the entry of nearly all heat and noise."

"But first you must be examined physically and mentally by our staff of doctors and psychiatrists, and we shall leave you in their care now."

With the examination completed Bob found himself in the registration room where the future date of awakening was recorded and the guest fee paid. He was now an official guest and about to start through the several processing rooms.

Beautiful nurses in white took charge of him now and placed him on a downy soft table, gently removed his clothing, then wheeled him into the aromatic room where induced relaxation permitted him to pass into a peaceful sleep.

Next, he was wheeled into the pre-sleeper where skilled physicians examined him again, and administered anesthetic to produce a deeper sleep.

He was then wheeled into the pre-suspension room where highly skilled technicians placed him on an automatic carrier which in turn carried him into the freezing chamber. Temperatures here were 250° F. below zero which freezes instantly and suspends animation completely. The carrier finally deposited him in the inner cell where the temperature remains at –250° without a fluctuation of more than 1/10 of one degree throughout the time of rest.

Time passes—200 years of it—and finally the specified date of awakening arrives. Conveyed into the tempering room his temperature is raised at the rate of only one degree per 12 hours for the first 250°, 2° per 12 hours for the next 20° and 4° per 12 hours up to 84° F.

The guest was then moved to the Electronic Pyrator where he was slowly heated by electronic induction to 104° F. for a time specified by attending physicians who keep a constant check on reactions. As signs of returning life was evidenced, the guest was placed in the inhalator to produce artificial respiration and the heart was started again by electrical impulses.

Consciousness begins returning and Bob is wheeled into the sun room. Nurses are in attendance now and they help muscles return to activity by gentle massages with aromatic oils. Voices in the distance come faintly to Bob's ears. They seem to approach nearer and nearer growing louder and more distinct. He shivers—awakes with a start.

Some one had opened a window. It was drafty—no wonder he felt cold—lights were on in the room again—the smoke had cleared from the air. The meeting was still going on but the movie had ended.

Phew! what a dream—lucky he had not been discovered sleeping—might have been embarrassing.

Our apologies to Bob Saunders for using him as the chief character in this story. The facts are that "Deep Sleep Inc." was Bob's idea which was rearranged and built up into the foregoing dream. We do wish that Bob had dreamed on a little longer so that we could learn something of that world of 200 years from now. We wonder for instance, what luck he would have finding an apartment to live in.—Editor.

* * *

WARTON SCHOOL

(Continued from page 35)

The school at Warton was opened on September 17 and a second course was scheduled to begin in mid-November. It was established on a former U.S. Army Air Forces base depot and sprawls over an area of 45 square miles between Preston and Blackpool in the industrial county of Lancashire. Warton "Tech" is one of three Army-sponsored centers of learning under the control of the Information and Education Division. The others at Shrivenham, England and Biarritz, France, specialize in academic training. The total enrollment at Warton reached almost 2,400 enlisted men and officers for the first course, but it is expected that 4,000 will attend the second course. Training also is offered in carpentry, welding, cabinet-making, surveying, drafting, painting and decorating, automotive and aircraft mechanics and other trades.

SERVICE POINTERS

Practical Solutions of Your Service Problems

THIS department is an aid to service engineers who are seeking new devices or methods to improve their work. All the service pointers have been supplied by the subscribers. THE REFRIGERATION SERVICE ENGINEER invites readers to submit "down-to-earth" practical service and installation information. Five dollars will be paid for each pointer published. Every service engineer has one or more "kinks" that have proved useful in every day practice. Here is your opportunity to exchange service pointers with the other fellow and earn $5.00 for the information. Write up your idea today and mail it to the *Service Pointer Editor*.

THE CASE OF THE OSCILLATING PUMP

THIS is indeed a sad tale. The chief character being a compressor. Not an ordinary compressor, mind you, rather one gifted with talents. In its younger days, it would perform its duties as required. It ran in a counter-clockwise manner, drawing deep breaths of sulphur into its body and expelling it savagely through the discharge valve. However, time marches on and after a few billion revolutions, say twelve or thirteen years worth, the discharge valve became weaker. It had pounded itself thinner and out of shape.

Now a very strange phenomenon took place which affected not only the entire refrigerators operation and ruffled the sweet disposition of the housewife, but baffled the best detectives in the refrigerating business! This strange phenomenon shall probably go down on record as the mystery of the oscillating pump.

At this point in order to hasten the story to a much more rapid and paper-saving conclusion, we shall refer to our records of the case—Number 5007: Name: Frigidaire. Approximate age: 13 years. Type: Low pressure control operated. Complaint: Short-cycles. Known previous history or service: Motor repaired several times.

General information: This short-cycle complaint had occurred twice previously in the past two years. On both occasions the motor was taken back to the shop for testing. The mechanics' reports were identical. The machine short-cycled with the control lever at any position in about five to ten seconds. The queerest feature was the fact that as soon as it cut out, and during the off-cycle, it appeared that the motor made several immediate attempts to start. The brushes could be heard riding the commutator in successive stop and start movements.

On both occasions, the motor was removed to the shop for testing and in both instances the motor was returned untouched, as the tests bore out the fact that the motor, its windings, etc., were perfect!

Still Short-Cycling

On the following day a report came in that the box was still short-cycling. "Pop" was sent out on the jobs. (In vaudeville, they say you are born in a stage trunk. Pop was born in an ammonia tank.) That is just to give you an idea of Pop's experience! The next day Pop's report came in:

Record 5007, Section 2:—Reference to the thirteen year old short-cycling Frigidaire: This job is a real humdinger. Soon as the box cut off I peeped inside at the unit and what do you think? I heard the funny sounds the brushes were making, then looked at the motor fan and saw it turn first half way in one direction, then turn in the other direction. It did this three or four times, then pifff! The unit cut in again! Then pifff, it cut out again! This time I noticed that just as the motor was rocking back and forth, the low pressure control contact arm lowered itself until it made contact, and—you said it—off again! So, I waited again until it cut out. This time I watched the pump and it, too, was rocking back and forth!

Now see here, boss, the system was checked. No restrictions. Refrigeration temperature perfect. Suction valve front-seated correctly to allow normal operation of control. Motor condition perfect! Suction O.K.! Pressure O.K. Belt—ah, wait! Something funny here. Belt very narrow. Hardly a wide enough Vee in it. Very queer. Very queer indeed. It cycled again. As soon as it cut out I slipped the belt off. It was very quiet, but the pump flywheel

continued to rock back and forth! In a few seconds it stopped. O.K. BOSS, I'VE GOT THE ANSWER! The discharge valve leaked!

Sure, while the pump was running, it managed to maintain the pressure. After a while the evaporator froze up, float stopped the suction line, pulled a vacuum and cut the unit out. As soon as the unit stopped, the high pressure gas in the condenser backed up through the discharge valve. So—when the gas backed up it lowered the piston, turning the flywheel. At the same time inflating the low pressure control bellows which lowered the contact arm. In the meantime, mind you, when the piston lowered, the suction valve went to work and allowed some accumulated back-pressure to enter the pump, reversing the piston action, in turn reversing the flywheel. Of course, that meant more gas in the pump, and the low pressure control contact arm lowered itself still more. By the time the pressures had equalized in the pump, the control had made contact and off it went again. The belt? Oh, yes. The belt was so narrow that it offered very little friction resistance at the pulley, making it easier for the pump to "oscillate." *Submitted by M. G. Horwitz, Washington, D. C.*

S S S

"COLD POT" FOR COLD CONTROLS

A "COLD POT" used to set cold controls is a useful tool. I used a 2 inch piece of copper pipe scrap secured from a plumber's scrap pile. A disc was cut and soldered to the bottom of the copper tube. This tube was cut slightly longer than the depth of an old deep well cooker from an electric range, in which the tube was placed, and the cooker filled with mineral wool for insulation. Before installing the tube it was wrapped with five-sixteenths inch copper tubing as closely as possible and soldered to the tube. This made a good evaporator. I used an automatic expansion valve to meter refrigerant to the "cold pot" and the copper 2 inch tube was filled with Prestone. A solid top in the form of a funnel was placed over top of insulation and secured with tar to make an air tight seal of the insulation. I installed a thermometer holder permanently in the 2 inch tube made from one-half inch tubing with holes drilled in sides. When checking cold control I clamped the bulb of a dial thermometer to the cold control feeler bulb, so that when removing control bulb from "cold pot" the cut in temperature could be checked as well as cut out. This makes for easy and quick adjustment of cold controls. *Submitted by E. F. Rhodes, Wichita, Kan.*

S S S

TESTING GRUNOW UNITS

LEAKS—A leak test must be made before, or some time after, the system has been opened in order to allow all carrene in the air, not coming from the leak, to be cleared from the room.

Place the charging T in the liquid line and pump the system up to 50 pounds pressure, except the C unit, with the tire pump. Too much pressure will open the shaft seal on the C unit, so use about 15 pounds pressure.

Test for leaks in the usual way with a halide torch. Small leaks are hard to find with a torch. A small high side leak will let the carrene charge cut off the unit in time and a small low side leak will let air and moisture into the system. Sometimes a unit will work for two or three months or more before giving an indication that there is a small leak. Most call-backs are due to leaks, sludge, dirt or moisture in the system.

The best solution to a small leak problem, when the leak cannot be found with the torch, is to inspect every flare joint for cracks or corrosion and use oil or vaseline on the flares and threads when reconnecting the joints.

ELECTRICAL TESTS—If the unit will not run with the plug and overload switch in, test the thermostat by removing the relay box cover and short circuiting the two outside terminals. If the unit and fan runs, the trouble is in the thermostat; if only the fan runs, the trouble is in the motor, if nothing happens check the lead and plug. Watch the starting contact, no flash indicates an open capacitor.

FAN—A sluggish or inoperative fan with a good winding can usually be repaired by adjusting the air gap, washing out with gasoline and oiling with a light weight oil. Check fan for bent blades if it is noisy or vibrates. *Submitted by C. L. Carter, Pueblo, Colorado.*

S S S

USE BROKEN EMERY WHEELS

BROKEN pieces of emery wheels make fairly good wheel trimmers. The coarse grained hard wheels used to trim softer wheels are best.

QUESTIONS AND ANSWERS

On Problems of Servicing, Installation and Maintenance of Household and Commercial Refrigerating Equipment—Send Your Problems to the Question Box.

COMMENTS OF QUESTION 719

IN regards to Question No. 719, in the November issue, you are very likely wrong on the man's trouble with the Grunow Carrene Meter. The large carrene meter has been used for replacements on all models, and there is no difference in the capillary tube. The small meter was replaced, originally, because the small meter had insufficient capacity in the receiver, and if the capillary tube would plug up, the entire charge of carrene would back up through the condenser, filling it, and causing a high head pressure resulting in a burned out compressor. However, the performance of the two meters was the same.

There are two possibilities of trouble from the gentleman's description; one is that the compressor is worn, and the other is that the inlet screen is partially plugged up.

To check the compressor, warm up the unit by running, disconnect suction and discharge lines and attach a gauge directly to the suction fitting. I use a ½" female to ¼" male flare fitting. The gauge should read not less than 28" vacuum. A good compressor will pull over 29" on an accurate gauge.

To check the inlet screen, which is under the check valve inside the compressor, disconnect the gauge and fitting and run the compressor. The air will rush out of the discharge port at a high pressure, and if it does not, check the screen.

One other possibility, that I find frequently on these Type "J" units, is the condenser being partially plugged at the outlet. I use a tank of CO_2 to blow out every one that comes in.—*F. E. Chambers.*

MONTGOMERY WARD PUMPS OIL

QUESTION 720: One machine that troubles me is a Montgomery Ward methyl, automatic expansion valve, universal compressor job that would slug oil ever so often until it would loosen the head bolts enough to lose the gas. I replaced the compressor with a new Kelvinator compressor. This helped some but still at longer intervals it will slug oil until one thinks it will break the valves. It freezes o.k., cycles o.k., and the expansion valve is not erratic, although the suction line will either sweat or frost each time it cuts in. Is there too much oil in the system?

ANSWER: The symptoms you have described on the Montgomery Ward units indicates either too much oil or a leaking expansion valve. If an overcharge of refrigerant is present, then a leaking expansion valve will permit the evaporator to fill during the off cycle. I am inclined to believe the trouble is a combination of both these conditions.

UNIVERSAL COOLER TROUBLES

QUESTION 721: For the past year my duty has required me to service our division refrigeration equipment. Mostly the equipment consisted of walk-in coolers. The units were powered by four cylinder continental engines. I have in mind a problem for which I desire help. This is it:

It was a Universal Cooler Unit. Compressor, condenser, receiver, heat exchange (outside of box), expansion valve thermostatic, heat exchanger in evaporator compartment, solenoid valve, blower type evaporator, refrigerant (Freon) head pressure 150 lbs., back pressure 8 to 12 lbs.

The complaint was that the box under continuous operation would get no colder than fifty degrees. The sight glass in the liquid line showed bubbles and much foam when the receiver valve was closed. I added refrigrant, the bubbles did not disappear, the back pressure did not raise, the situation was not helped. I then decided that the foam in the sight glass was caused from too much oil mixed with the refrigerant. I pumped unit down and disconnected liquid line at the receiver. Opened receiver valves and let the refrigerant spray onto my hand. It didn't get cold enough to form a frost. The problem was licked. The trouble was that the boiling point of the refrigerant had been raised due to so much oil being mixed with it. (Does that happen often?)

Well, I blew the excess oil and refrigerant out of the system. Recharged the machine. The unit ran the following night continuously. The situation had been helped. The box went down to 40°. That's not cold

enough for the purpose of the box so the problem was not whipped.

A Detroit 673 expansion valve is located on the panel of the power unit. The line leading from the valve to the evaporator header never accumulates any frost nor does the evaporator. I disconnected the thermo bulb and warmed it in my hand. Immediately a frost back occurred (started at the heat exchanger). Well I then figured that the liquid line in the heat exchanger had sprung a bad leak and that the refrigerant was by-passing the coil and going right out the suction line immediately. I by-passed the two heat exchangers and the situation was still the same. Since then I have replaced the unit, but I am very much puzzled as to what was wrong with the unit just mentioned. Any ideas?

A Few Additional Questions

Since I have written you this somewhat lengthy discussion how about the addition of a few questions.

1. Do bubbles in a liquid line sight glass ever mean air is in the system?

2. When is the proper time to check the superheat settings on valves in operation? I would use a thermometer immediately ahead of the valve and another thermometer at the end of the evaporator where the thermobulb was clamped. Right?

3. What superheat for forced draft unit coolers?

I appreciate the effort THE REFRIGERATION SERVICE ENGINEER is making to enlighten its readers.

ANSWER: Your problem on the Universal cooler installation is difficult to analyze without more complete data regarding operating pressures and the type of coil used, the size of line from the expansion valve to the coil and the diameter of the evaporator tubing.

You mentioned having blown the refrigerant charge in the condenser, but did you also blow the oil and refrigerant in the evaporator?

The explanation of the trouble leads me to believe that so much oil had accumulated in the evaporator that the pressure drop was excessive. This excessive pressure drop would act the same as a high super-heat setting and would starve the coil. Further evidence of an excessive pressure drop is in evidence when the valve bulb was warmed by hand. Evaporating at a low pressure would not take place until the refrigerant had passed through the coil.

It is quite possible that the compressor valves were not holding which would materially reduce its capacity. There is no reason why one unit would do the job better than another of the same capacity at the given evaporator temperature. You, no doubt, corrected the trouble when you exchanged the units although the trouble could have been in the low side rather than the high side.

Sight glass indicators will not show air in the system unless the refrigerant charge is below that which it should be. The air does not enter into a mixture with the liquid.

The superheat setting should be checked while the machine is in operation. This is necessary to get the actual conditions under which the valve is operating. A factory set valve will not necessarily maintain the same superheat when hooked to a coil for reasons given earlier.

Determining the superheat is a matter of comparing the pressure and temperature relationship of the refrigerant. This must be done because the back pressure (pressure drop) in the coil operates to close the valve along with the operating suction pressure. Thus, the pressure in the coil at the inlet is higher than at the outlet. The boiling point of the refrigerant at the coil inlet compared to the pressure-temperature relationship of the refrigerant at the coil outlet.

Forced draft coolers operate best with a 5 to 7 degree superheat. The setting of the valve will depend on the coil and compressor capacity balance; hence, no fast rule can be held on the valve setting.

CARBON-TET IN SO_2

QUESTION 722: I have been taking your magazine since 1935, and there is no question that it has been a great help. At times I still refer back to the 1935 issues.

This is the first opportunity I have taken to ask for some information. I am at a loss to know just what effect Carbon-tet will have on SO_2 if a quantity is left in the refrigeration system.

ANSWER: To our knowledge, carbon tetrachloride will have no damaging effects on sulphur dioxide. Both of these chemicals are relatively stable and therefore they should not cause any damage when mixed. I would not permit more than a trace of any foreign gas or liquid to remain in a system, however, before charging with the refrigerant.

If you have reason to believe that some carbon tetrachloride is in a system, I would suggest the system be completely evacuated.

What Of The Future

A recent Town Hall Meeting of the Chicago Chapter R.S.E.S. featured the opinions of four speakers representing four branches of the refrigeration industry on the above subject. Herman Goldberg presided over the discussions as moderator, introducing the

FOR THE SERVICE ENGINEER

By P. B. REED*

THE refrigeration service man has been doing a good deal of thinking about what is going to happen to him and his place in the refrigeration industry, now that the war is over. If he has continued in his work throughout the war he is looking forward to expanding his operations. If he has been out of the industry for a time engaged perhaps in other phases of war activity, he is thinking of just how he can best re-enter the industry and what particular niche he will fill in refrigeration. If he has been in the Army or the Navy, and has been working in refrigeration, he is probably looking forward very eagerly to getting back into civilian refrigeration. If he was a refrigeration service man before entering the service, but has not had an opportunity to continue with his trade in the service, he is very probably trying to decide whether to go back into refrigeration service, whether to enter sales or some correlated activity, or possibly he may be considering going to some other type of work. In addition to these there are numerous men who are just getting out of the Army or Navy who have had no experience in refrigeration, who perhaps were barely out of school when they entered the service, and who are attracted to the refrigeration industry.

P. B. REED

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* Manager, Refrigeration Division, Perfex Corporation and Chairman of the Wartime Educational Board R.S.E.S.

THE JOBBERS' VIEWPOINT

By JACK GLASS

THE refrigeration supplier, jobbing locally as well as nationally, is committed to have as many refrigeration part units as possible at all times on his shelves in order to facilitate the services of the refrigeration service man to the ultimate cussumer, the housewife, the merchant, or the industrial user of refrigeration.

JACK GLASS

It would be impossible for any independent service man to carry all of the important parts in his own stockrooms and certainly it would be too costly a venture to attempt carrying all the items in the necessary quantities.

To the manufacturer the refrigeration jobber performs a necessary service in the way of warehousing all manufacturers' items which are available and channeling them to the best points of service distribution so that all manufacturers' parts can be given the best installations where they are most needed and where they will perform the greatest service towards the maintenance of refrigeration equipment.

In the past, the jobbers throughout the country have grown up from various sources because of necessity and the services which they could render to the service man as well as to the manufacturer. Today, these jobbers and their efforts are recognized by the manufacturers and by the service men to

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*Chairman of the Central Refrigeration Wholesalers Association.

Refrigeration Service

speakers and conducting the question period following each talk. The four speakers and their opinions are presented on these pages. An appeal for continued cooperation and a unified effort coupled with a highly optimistic outlook was part of each speaker's address.

FOR THE MANUFACTURERS

By K. B. THORNDIKE*

IT WAS just about ten years ago when the Refrigeration Service Engineers Society had their annual meeting at Detroit. This was quite an historic occasion for the reason that at the time of this meeting there was formed what is now the National Refrigeration Supply Jobbers Association and the Refrigeration Equipment Manufacturers Association.

K. B. THORNDIKE

Much of the credit for the formation of these important segments of the refrigeration and air conditioning industry should go to the late Frank Cockrell, founder of Electric Refrigeration News.

Since this Detroit meeting, the Refrigeration Service Engineers Society, the Refrigeration Equipment Wholesalers Association, and the Refrigeration Equipment Manufacturers Association have worked in close harmony and many problems confronting the industry have been successfully solved.

It is very doubtful if material for repair and maintenance of mechanical refrigeration would have been available during the war period had it not been for the close cooperation between these Associations, their membership, and their Executive Secretaries.

Practically all of the members of the Refrigeration Equipment Manufacturers Association have been engaged in war work, but at the same time and through the cooperation of the various agencies in Washington

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*Vice President, Western Regional Office, Detroit Lubricator Co., Chicago, Ill.

AS IT APPEARS TO RSES

By H. T. McDERMOTT*

THE refrigeration service business, in common with most other businesses, has come through a period of trying conditions with a record that they can be justly proud of.

H. T. McDERMOTT

We can reflect back now and consider what then seemed impossible. Shifts in civilian population, limited manpower, the imperative necessity for maintaining existing refrigeration equipment, and at times short supplies of essential parts and equipment, as well as other seemingly unsurmountable objects, appeared to be beyond solution. Yet withal, we find that the refrigeration service industry established a record that by comparison with other service industries, was so far ahead as to leave little doubt that the service and maintenance end of the refrigeration business was no longer a "necessary evil," but an integral part of the industry. As evidence of this record, reliable unbiased sources of information, which incidentally have been published in the daily press, show that 98 percent of existing refrigeration equipment was maintained in operating condition, as compared to a service record of 85 percent in the radio field. Not only did we face the handicap of lack of materials and manpower for our business, but it was a strange experience indeed to those of us who found it necessary to first sell the importance of refrigeration to the

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*International Secretary RSES and Publisher of The Refrigeration Service Engineer.

For the Service Engineer

(Continued from page 42)

Those fellows who have engaged in civilian refrigeration service or other civilian activities during the war, have been working long hours, and some of them would like to take a little time off and rest up, but the probabilities are that very few will do so. The point is, however, that most of them have made very good money during the war, and have a very comfortable nest egg. Those who are now working for someone else are considering investing this money in going into business for themselves. Those who were already in business for themselves are considering expanding that business.

Sales Will Be Good, But—

Shall they engage in or expand their activities to the sales field? Many refrigeration service companies that in the past have sold very little equipment other than an occasional replacement coil or condensing unit, and, of course, parts, refrigerant, etc., are now intrigued with the possibilities of selling freezers, household refrigerators, room coolers, and even store equipment. In their contacts with users they have learned which of these users' equipment is about at the end of its rope, and must be replaced. They have a very good idea as to which of these prospects can afford to replace the equipment. They know about what type of equipment this prospect will want to buy, and in by far the greatest percentage of cases they enjoy the confidence of the prospect and are in an excellent position to make the sale.

The service man today can undoubtedly sell a great deal of merchandise, at least within the next year or so. A lot of this business would almost fall in his lap, provided, of course, that he could make early delivery.

However, as time goes on the regular sales organization will get back into operation. The dealers will get their sales crews organized, and the inevitable effect of good merchandising methods and experienced salesmanship will begin to appear and show results. The service man must not think that all of these plums will fall into his lap. If he is to engage in the selling field, that is, if he is to actually become a dealer, he is going to have to adopt good merchandising methods. He is going to have to learn how to sell. He is going to have to learn how to manage salesmen. He cannot expect to do his own service work and do selling also, except perhaps an occasional sale that he can pick up. A divided operation of this sort will probably lose him money, for he will probably lose time from his service work to make the sale.

Unless the service operator wants to go into selling enough to provide a nice, pleasant display room, have at least one man who gives his entire time to selling, and has arranged proper financial connections so that he can handle his "paper", he had better stay in servicing and make arrangements with some dealer to give him a commission on prospects that he will be in position to turn over to the dealer. This does not mean that a service operation cannot include a sales operation, but it does mean that if it is to succeed the service operator or service company is going to have to, in fact, become a dealer.

Service Only for Some

After careful consideration many independent service operators are going to decide to stay out of the selling end of it and stick to their own phase of the refrigeration business. They are going to decide that they know the refrigeration service business, but they do not know the merchandising end of it, and they are going to decide that the service field also offers excellent opportunities, that the service business is a good, dependable business, that it is less affected by fluctuations in general business conditions than the selling end, and moreover, many service men are going to decide that they get more pleasure out of their service work than from sales work, and perhaps after a brief excursion into selling they will drop back to service only.

Many of the service operators who will continue as "service only," are looking forward toward enlarging their facilities, especially their shop facilities. Many of them found during the war that when it was difficult to obtain parts a well equipped shop would enable them to repair parts and use them, or even to make a few parts that are difficult to obtain, and quite a lot of fellows are considering the possibility of buying a small lathe, drill press, possibly even a surface grinder.

Some service operators are considering the possibility of going into the parts and unit rebuilding business. They see hermetic units becoming more and more common, not

only in household, but in commercial sizes, and they are considering the possibility of setting up and equipping a shop for rebuilding hermetic units, not for their own use, but for other service men. They see the possibility of using methods that have been developed in the last few years to enable them to salvage parts for obsolete types of equipment, for which the parts are not only difficult to obtain, but are quite expensive.

Industry has at last found the "putting on" tool in the metalizing process by which various types of metals can be sprayed from a hot flame directly on to the part, and in this way worn parts can be built up and resurfaced. Scored shafts can be reclaimed, even bearings, rods, and many other parts can be rebuilt, even though they may appear to be hopelessly worn.

Hermetic Work Is Costly

A shop for rebuilding hermetic type units or open type units for others, involves quite a little investment, for it must be equipped with lathes, drill presses, grinders, bake ovens, welding and brazing equipment, and be provided with "dry air" under considerable pressure. For hermetic units a great deal of "know-how" is required, as well as equipment, and a well equipped shop must also be a very clean shop. This is the type of activity that must not be lightly engaged in, and the service operator would do well to very carefully investigate this field before entering upon it. Also, he should be sure that he will be able to get parts for hermetic units particularly.

The refrigeration service industry is much concerned with the returning veteran, many of whom will be coming back to the type of work they left, and probably back to the same shop in which they formerly worked. The veterans with little or no refrigeration experience will have to be trained. The service industry is aware of its debt of gratitude to the veterans, and is anxious to assist them in every way possible to get back into civilian life, into work that they like, and that will be profitable to them. The refrigeration service man through his organization, the Refrigeration Engineers Society, is nationally lending aid to veteran training programs. Locally, the chapters and individuals are giving their help to local educational programs. The industry needs more refrigeration service men, and as it expands through the tremendous sale of home and farmer freezers, household refrigerators, room coolers, beverage coolers, and the many other refrigeration appliances that have been unobtainable for several years, and many thousands of which will be needed to satisfy this pentup demand, more and more service men will be required, not only to install this new equipment, but also to maintain and service the increasing amount of refrigeration equipment in the field.

In all, the refrigeration service man looks forward to the future with a great deal of confidence. He has gained stature during the war by reason of his ability to do a good job in maintaining the nation's refrigeration equipment under extremely adverse conditions, lack of manpower, lack of parts, and supplies, and working longer hours overtime.

He sees in the future new opportunities for service to the industry, and to the public, and he knows that he who renders good effective service to his customers at a price that is fair to both the customer and himself, will in the long run profit best.

The Jobbers' Viewpoint

(Continued from page 42)

whom they sell the various products of the trade.

Prior to the war the even flow of merchandise made it a relatively simple performance to furnish the various service organization needs. During the war the jobbers proved their worth to the service companies by having whatever materials which might be allocated by the various war boards at the right time for the service man's needs. In this way the jobbers performed a very capable job for the government and filled a merchandise need to the various users of refrigeration who were supplied valuable refrigeration repair services by the jobber customers.

The jobbers' relationship to the service man, as well as to the manufacturer, in the future, will be of greatly increased proportions. Many new developments which were just recently in the blue-print stage will soon be out. It will be the duty of the jobbers to introduce these new items to the trade so that they will be merchandised correctly. This service, in itself, will be of tremendous value to the service man as it will probably be impossible for the manufacturers to obtain trained refrigeration salesmen to cover

the entire country on all items, and I believe that it may be through the channels of refrigeration jobbers that the manufacturers will find the easiest markets to their consuming dealer trade.

It also stands to reason that when the many items which were not available during the war are again in production and are added to the items which will come out as new developments, the jobbers' services will be increased as might well be their individual enterprises. The cost of operating jobbing establishments is expensive and were it not for the experiences which most refrigeration jobbers of today have accumulated during the past few years, the job ahead for the refrigeration wholesale supplier would appear of too great magnitude. I therefore feel that the industry as a whole, whether manufacturer or service man, should recognize the use and need of refrigeration supply jobbers throughout the country, and give the necessary support where it is due.

Past Activities

To summarize the above, I would like to mention the refrigeration supply jobbers activities during the past four years. Your jobber has tried to meet your requirements by ordering his merchandise as far in advance as his priorities would allow and also, by some means or another, supplying a substitute for material that was hard to get. There were times that your jobber was out of material essential to the jobs on which you were working. Most of you can understand and appreciate the circumstances. You know that it is our job to carry in stock everything that you require and as long as you are the buyers and we are the sellers you can rest assured that we will do our part by serving you to the best of our ability.

It will be recommended at the next Central States Refrigeration Supply Jobbers meeting that the local jobbers install a suggestion box in their stores into which you will be asked to drop constructive suggestions that will enable us to serve you better.

The jobbers resale policy will remain the same. It is outlined as follows:

1—He will not sell to manufacturing plants, hotels, and institutions where there are no service men.

2—He will not sell to service men employees of his customers to handle service work on the side.

3—He will not sell to any stranger unless he shows proper credentials and is actively engaged in the service business.

For the Manufacturers

(Continued from page 43)

having to do with the allocation of material for refrigeration, a sufficient supply of raw materials and components were made available to—for the most part—maintain essential refrigeration throughout this country. Again, this means industry cooperation and coordination.

All of you have no doubt at times cursed your wholesaler and the manufacturer of refrigeration products for not having material when you wanted it or the right kind of material which you wanted. Please let me make it clear right now—this was certainly no fault of your wholesaler or your manufacturer. A war had to be won and Thank God—it was won!

Although it is too early to predict the new refrigeration and air conditioning product which is coming on the market, this industry is assured of a very substantial growth during the next few years. Much new product is coming on the market in the way of equipment, and new and—we hope—better accessory product is going to be available shortly.

It is unfortunate that labor strife is retarding progress on reconversion, but we must face the facts. Manufacturers are still having a great deal of difficulty in getting raw materials in sufficient quantities to produce the desired amount of refrigeration material; and in some cases, lack of material has actually held up finished product. It is hoped naturally that this will soon be over, but you must bear with us for a while longer before you are going to get exactly what you want, when you want it.

You may rest assured that we, as manufacturers of refrigeration equipment, are striving harder than ever to make more and better material available to you at the earliest possible moment, so please be patient and don't ask or expect the impossible.

The Industry Show In '46

Although no official announcement has as yet been made, what will probably be the largest Refrigeration Show in history is being planned for the week of October 27th, 1946, at the Cleveland Auditorium. This All-Industry Show will be sponsored by the Refrigeration Equipment Manufacturers Association, but for the 1946 Show the Frozen Food Locker Manufacturers and Suppliers Association are joining with us to make it a really great Show.

Your Society is having its annual meeting in Cleveland at the time of the All-Industry Show and it is hoped that many of you will be able to participate in what we know will be the biggest Refrigeration Show in history.

If we can continue the cooperation of these organizations as we have been doing during the last ten years, there is no question but what it will make for a better industry. It is hoped that the industry problems that now confront us will soon be solved and that in the very near future we will be able to go full steam ahead.

S S S

As It Appears to RSES

(Continued from page 43)

various alphabetical agencies in Washington. Your national association, in cooperation with the jobbers and manufacturers found it necessary to do an elemental selling job to those we had presumed were fully cognizant of the vital necessity of refrigeration as a war tool. It was not an easy job and much credit must be given to these associations who presented a united front in the interest of the service field.

This cooperation brought about a better understanding as to the interdependence of each of our groups upon the other, and should reflect to our mutual advantage in the days ahead.

The jobber is an important link in the economic distribution of the commodities we need in our business. His investment makes it possible for us to give the service that has and will continue to expand our business. He is a member of our team.

Without the manufacturer you and I wouldn't be attending meetings of this nature and endeavoring to learn whether refrigeration is going to offer us the possibilities we want for future security. So, too, the manufacturer is a member of our team.

As to the future prospects of the jobber and manufacturers without an efficient and capable field organization of service men and organizations such as most of you men represent—I'll let you answer that one. So you see there is a close mutuality of interests that must be recognized. I like to compare these three interests to the old-fashioned three legged milking stool—kick one leg out of our stool and someone is going to find themselves in an awkward position.

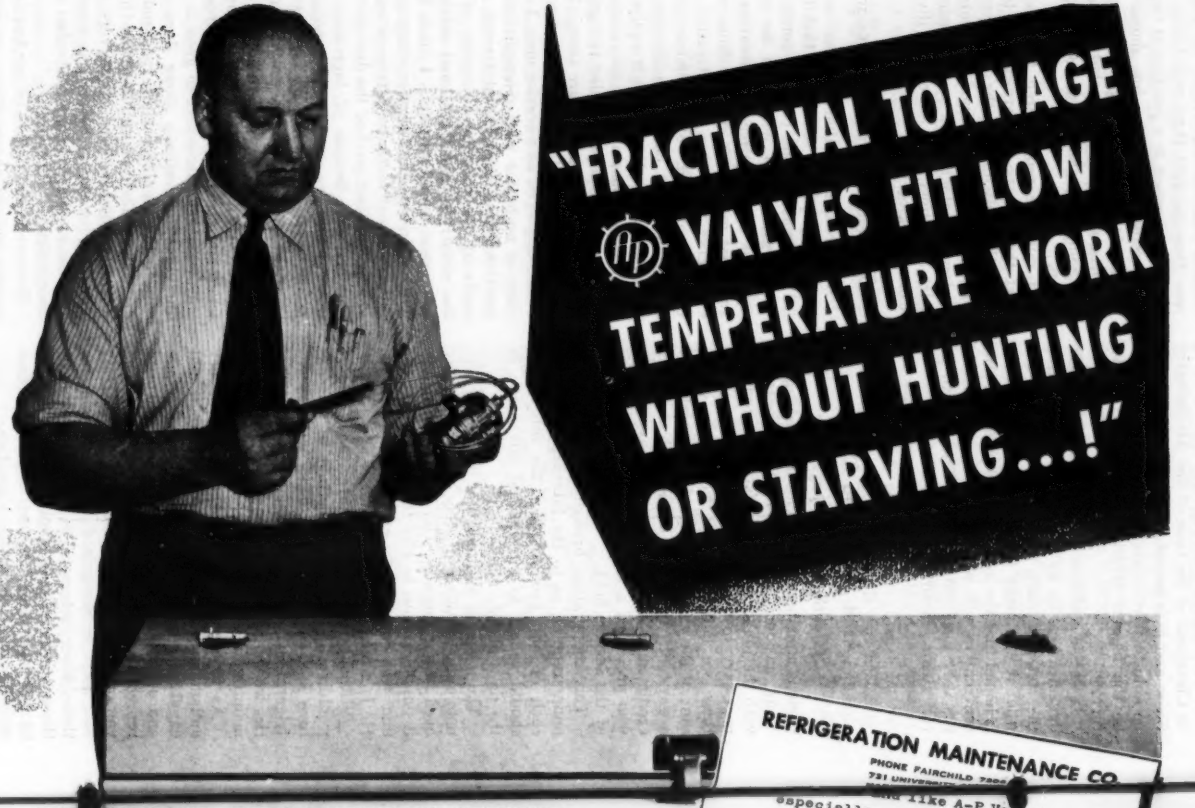
I do not believe there is a comparable period in the history of refrigeration that has emphasized the importance of the service man than the past three war years. He has advanced himself to a position of importance and recognition. His job should not be quickly forgotten, but right here we face an important decision as to what advantage we are going to make of our hard earned position.

It must be remembered that during the past three years the service man is practically the only one in the refrigeration industry that has maintained an uninterrupted customer contact. With no equipment to sell, sales personnel were of course diverted to other types of work.

Serviceman's Position Recognized

All through this time, the user of refrigeration equipment recognized that the service man was the one point of contact in the refrigeration field who must be depended upon to keep equipment operating. I am sure that many of you know from your own experience that when consideration is given to new equipment, your recommendation will in all likelihood carry considerable weight in the final selection of such equipment. I might say, in passing, that manufacturers of refrigeration equipment also recognize your position in respect to future sales. Whether you operate your own service organization, or are employed as a service man, I can conceive of no better way of emphasizing your position today than the statement recently made by the director of service of one of the country's largest national refrigeration equipment manufacturers. I quote him verbatim: "Independent service companies have become a real factor in refrigeration. They are a recognized part of the distribution system and will become of increasing importance if they recognize their responsibilities. Many service companies who have contracted with a seller of a product to handle all service, have realized that they have an obligation to protect the good name of the seller and the product, and also realize the only way they can expect to grow is by conducting their business along lines of fairness to the user, the seller, the product and themselves. The results have been that these service companies have grown very rapidly, and have become recognized as good sound business men and highly respected in their communities.

Because of the nature of our business, our average individual operations are small. In many ways I believe this to be an advantage. However, this may have a tendency



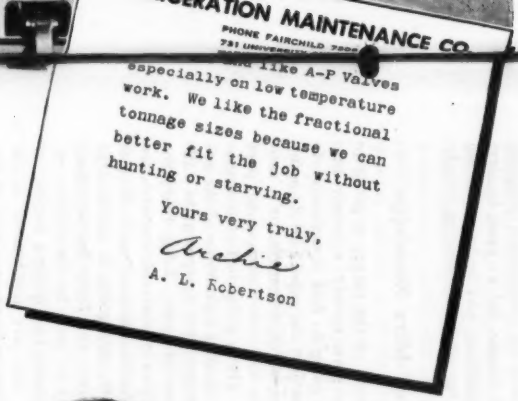
EXPERIENCED REFRIGERATION SERVICE

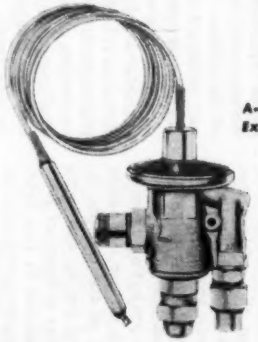
EXPERIENCED REFRIGERATION SERVICE

Engineers like Mr. A. L. Robertson, of the Refrigeration Maintenance Company, Madison, Wis., give full credit to "A-P Dependable" Refrigerant Valves for their special adaptation to low temperature work. They find that "A-P" fractional tonnage sizes for Freon or Methyl Chloride refrigerant applications make it easier, as Mr. Robertson states, to fit the job without necessity of "hunting" or "starving" the line.

Offering a wide range of adaptability, any standard A-P Refrigerant Valve can be used on Air Conditioning, Commercial Temperature and Low Temperature work without special attachments or without changing valves. Thus one standard A-P Valve fits a variety of applications.

Write for Illustrated Bulletins covering A-P Refrigerant Valves.





A-P Model 205 Thermostatic Expansion Valve. Capacity, up to 1 ton Freon.

AUTOMATIC PRODUCTS COMPANY

2454 N. 32nd Street, Milwaukee 10, Wis.

Export Dept. 13 E. 40th St., New York 16, N. Y.

DEPENDABLE *Refrigerant Valves*

Stocked and Sold by Good Refrigeration Jobbers Everywhere — Recommended and Installed by Leading Refrigeration Service Engineers

toward creating an inferiority complex about our position in the industry. Let's dismiss that type of thinking in a hurry.

I think that this is a good time to learn just how small or how large is the business we represent. In a recent survey it was shown that approximately 60 percent of the service companies were operating with two or less employed men, and this figure increased to 80 percent when we consider service companies operating with three or less men. Certainly no one can deny this can be considered small business as businesses go.

The Government in its Census of Businesses, made a survey of the refrigeration service industry back in 1939, and included in their classification only those refrigeration service companies that were operating as independent establishments. On the basis of those figures and projecting them to include some 10,000 such service companies operating, the aggregate of the receipts involved in both the sale of service and parts and equipment, approaches a figure of $70,000,000 annually. Considered in this light, this is far from small business and capable of supporting many large industries in our country.

Future Position

So much for our present position. The question which concerns us most is—what of the future? The question is often asked, just what is going to happen to service with the continuing advancements being made in manufacturing methods, and the increasing application of the hermetically sealed compressor. To give a brief answer, I am of the opinion that some service men have been unnecessarily concerned about a situation that, rather than reduce business for the service man, will, to the contrary, have a tendency to make more and better business for those individuals, providing that they can recognize the future possibilities and be so equipped by experience and vision to accept the additional responsibility that is sure to come.

With all due respect to the fine work that manufacturers have done in perfecting precision methods of manufacture, there is no mechanical equipment produced subject to everyday operating conditions that does not require occasional mechanical attention. We have not arrived at the age of perfection and I am sure that universal use of foolproof atomic energy is something for the next generation to concern itself about.

Just as the service field has come a long way during the past ten years, there is nothing that can stop an accelerated progress during the next decade, but we must be alert to changing conditions and be in a position to take advantage of these changing trends.

Will Need More Knowledge

The service man of the future is going to be much more than merely a repair mechanic. He is going to find it necessary to know more than just the repair or changing of an expansion valve, a control, or a condensing unit, or any other component part of the system. He is going to find it necessary to have a broader knowledge of the application of refrigeration equipment in a diversified number of uses. Let's take, for example, a subject of current conversation as far as refrigeration is concerned—that of frozen foods. We are going to see a large production of home and farm freezers manufactured, many of them by the old line established companies, and quite a number of manufacturers who are newcomers in the field who feel they can secure a part of this business. I venture to say now that a majority of the service calls will not be the result of the failure of the equipment, but the lack of knowledge by the user as to what the refrigeration equipment is designed to do. As usual, the service man will be required to rectify some of the mistakes that the overenthusiastic sales department is bound to make. It is quite conceivable that among the many qualifications necessary for a good service man, he may find it necessary to add that of food specialist. Looking at the commercial side of the picture, nutrition specialists tell us that food processing requires refrigeration from the time of actual harvest until it reaches the ultimate consumer. Portable refrigerated food processing machines in the field, refrigerated transportation to storage centers, thence to wholesale distributing points and retail outlets is going to require considerable refrigeration. Who is going to be responsible for maintaining this refrigeration equipment?

What of the many new industrial applications that have resulted from our experience in war production. This is the type of equipment that is going to require the services of experienced service men, and incidentally, is going to make a profitable commercial business. Sub-zero chilling for testing purposes and treating metals, for example, will be one critical application. Sat-

isfied customers among these classes of users can establish an enviable position for the community service man.

Some of the figures that have been given out for refrigeration are staggering. They seem difficult to comprehend. At times one is concerned whether the industry will have enough productive capacity for years to come to answer all of the demands that the public is going to make. Here is a forecast made exactly two weeks ago as regards air conditioning: The statement has been made by an economist, a member of a large New York financial institution. He claims that the demand for air conditioning should represent a market of one and one-half billion dollars worth of business within the next five years. His report reveals that air conditioning has gone further in the ten prewar years than domestic refrigerators, radios, washing machines, electric ranges and automobiles went during their comparable period of growth.

Air Conditioning

Only 3 percent of department stores, 3 percent of doctor and dentist offices, 2 percent of bank establishments, 2 percent of drug stores, 6 percent of restaurants, 4 percent of beauty and barber shops and 5 percent of hotels are air conditioned today.

As to the popularity of air conditioning, this economist says "air conditioning in every home" is obviously a more likely objective than "an aeroplane in every garage," and hotels in the future will advertise "all rooms air conditioned" instead of "all rooms with private bath."

From another angle of the future of our service business, let us look at such standby commercial customer users of walk-ins, reach-ins, bottle coolers, beer dispensers, display cases, milk coolers, etc. One manufacturer of such equipment, not a large one at that, has reported that one of his Ohio distributors operating in four towns of a quarter million population each, has placed an initial order of some 1500 units representing an amount of $565,750.00, with the statement that his market will absorb many more units in the first postwar year. Some service company is going to make these installations.

Here is what another good commercial customer of the service man needs—in fact, considered the third largest retail trade—restaurants. Ultra conservative estimates place the number of individual restaurants at 88,000. The National Restaurant Association made a sample survey to 1,010 restaurants, and according to returns each was planning to spend an average of $1800 as soon as equipment was available. The major items of expense listed included: $250.00 for dishes, china and glassware; $123.00 for silverware; $50.00 on appliances, toasters, juice extractors, coffee brewers, etc.; and get this $370.00 for refrigeration to include overhauling and new equipment.

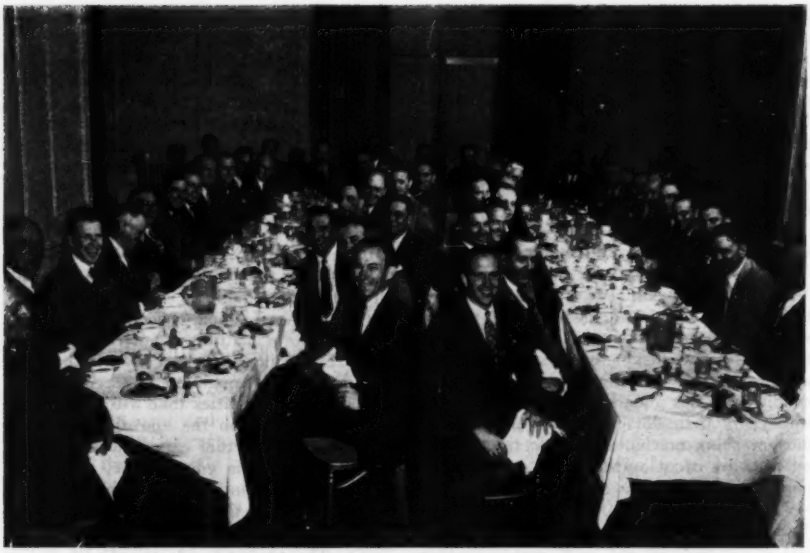
In the face of the foregoing facts and the necessity to not only install, but maintain all of this equipment as well, should the refrigeration service man concern himself with the question of his future, but rather are we ready to maintain the accelerated pace of the industry and qualified to accept the additional responsibilities that will be ours.

I merely mention the above instances to show you from actual experiences what the postwar market is going to be, and in an effort to dispel any doubt in your mind as to the future of the service business.

The New Men in the Field

I think we should be reasonably concerned with getting the right caliber of men started in the business because it seems apparent they will be needed. Here again, too, many service men often spent a good part of their time on thinking in terms of too much competition in the business. Competition is what we make it. It can be either good or bad. If it is the opinion that it is easier to meet competition by dropping to the level of poor competition, I am afraid there is little hope for the individual operator who adopts such practices. On the contrary, if we go out with the objective of establishing our business on a legitimate basis, to give a guaranteed service with a fair return, I am equally confident that that service organization is going to enjoy the success they deserve.

Right here, I would like to point out that many men in the Armed Forces have been encouraged by the outlook of the refrigeration industry. A number are thinking in terms of selling equipment, while a large percentage being mechanically minded are interested in the installation, maintenance and servicing end of the business. We have a responsibility in seeing that these men are correctly guided in our field, and your local chapter can accomplish much good in this direction.



VIEW OF THE LUNCHEON MEETING OF SOUTHWEST JOBBERS

SOUTHWEST JOBBERS MEET

THE annual meeting of the Southwest Refrigerator Equipment Wholesalers Association was held November 20, in the Baker Hotel, Dallas, Texas. Closed meetings were held in the morning and afternoon and at noon the jobbers invited manufacturers and their representatives to be their guests. There were 27 jobbers and 22 from the manufacturers group attending the luncheon. Two additional guests were H. R. McCombs, President, and H. S. McCloud, Executive Secretary for R.E.W.A.

Mr. Joe Mideke, Mideke Supply Company, Oklahoma City, Oklahoma, presided over the group. Officers who were elected at the meeting are: Chairman—Burl Boykin, Jr., Standard Brass and Mfg. Company, Beaumont, Texas; Vice Chairman—Alex Trevino, United Refrigeration Company, San Antonio, Texas; Secretary-Treasurer—R. J. McBrien, Electromotive Company, Dallas, Texas; National Director—Joe Mideke, Mideke Supply Company, Oklahoma City, Okla.; Executive Committee—Frank J. Walters, Walter Refrigeration Supply Company, Houston, Texas; Roy O'Hale, Motor Supply Company, Monroe, La.; Sydney A. Gaines, United Electric Service, Wichita Falls, Texas; K. G. Wight, K & M Supply Company, Tulsa, Oklahoma.

R.E.M.A. FALL CONFERENCE ATTRACTS RECORD ATTENDANCE

THE members of the Refrigeration Equipment Manufacturers Association met in Hot Springs, Va., November 7, 8 and 9 for their usual Fall Conference. Subjects covering O.P.A. regulations, reconversion, market surveys and other pertinent matters provided an interesting three day program.

The first day of the conference was devoted to meetings of the 10 product groups which comprise the REMA membership. On Thursday, President F. J. Hood, Marinette, Wis., introduced as the first speaker, Mr. Fred Schwarz, head of Mechanical Building Equipment Section, Buliding Materials Price Branch, O.P.A., who informally discussed the subject "O.P.A.—It's Price Regulations for Reconversion and Postwar." In his talk, Mr. Schwarz outlined the procedure that O.P.A. has adopted in adjusting manufacturers prices.

Vice-president Herman Spoehrer, St. Louis, Mo., in introducing Mr. Theodore Sills, Public Relations Counsel for the Association, stated that the Directors had considered favorably the continuation of the program and that the membership would participate on a voluntary contributing basis in

help sell air conditioning and refrigeration

Year after year powerful "FREON" advertising campaigns appear in leading publications read by architects, engineers, food manufacturers, locker plant operators, business executives, store owners and the general public. These campaigns do an important job of selling.

In TIME—the weekly news-magazine—"FREON" advertising reaches more than 2 million men and women in all kinds of businesses and industries.

In ARCHITECTURAL RECORD and PENCIL POINTS, another "FREON" campaign features air conditioning installations in buildings that have been planned for the future. These messages provide architects and engineers with ammunition to sell modern systems to their own clients.

In FOOD INDUSTRIES—a leading periodical catering to food manufacturers—more "FREON" advertising stresses the benefits and value of air conditioning and refrigerating systems to many different types of food processors.

In QUICK FROZEN FOODS, a series of "FREON" advertisements shows outstanding locker plants in various sections of the country. Operators are being made conscious of the advantages of modern equipment and "FREON" refrigerants.

All this advertising is aimed at helping to sell more air conditioning and refrigeration . . . it's helping to build business for you. For complete information about "FREON" safe refrigerants, write: Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington, Del.

"Freon" refrigerants are now available in unlimited quantities for comfort cooling, refrigeration and other uses.

any amount from $250 to $1000, as formerly. Mr. Sills reported on the work that had been done since the REMA public relations program was adopted covering a period of the past six months. A brochure was distributed to each member showing the type of publicity that had been secured.

Mr. F. K. Zimmerman, Defiance, Ohio, presented a comprehensive report on the accomplishments of the credit committee of REMA and the progress that has been made during the past several years, as well as plans for its expanded program in the future. Each year has shown a growing number of participating companies in this program.

Mr. K. B. Thorndike, Chicago, Chairman of the All Industry Exhibition Committee, reported briefly on arrangements for the All Industry show in Cleveland in October, 1946.

Arthur O. Beamer presented a paper on the refrigeration market in South America based on his experiences during a recent trip to the Latin American countries.

Mr. W. K. Maxwell, Detroit, was the first speaker at Friday's meeting. His paper "Control and Operation of a Field Sales Force" included an analysis of sales expense.

A formal report was presented by Mr. George Allen, Pittsburgh, Pa., on the subject of jobber relations and problems. The subjects suggested are to be considered in a joint REWA-REMA committee meeting.

Mr. Gene Robers, Cleveland, Ohio, covered a number of subjects pertaining to advertising programs in his talk "How to Work Out a Postwar Advertising Program."

The program concluded with two interesting papers. Postwar sales possibilities by E. F. Censky, Dayton, Ohio, "American Industry Looks Ahead," was a forecast based on the survey recently compiled by the Committee on Economic Development. "Analyzing Salesmen by Aptitude Tests" was presented by Dr. M. Fleming of the Klein Institute of New York, who briefly outlined the aptitude testing method in the employment of salesmen and other personnel.

S S S

NEW ADVISORY COMMITTEE HOLDS FIRST MEETING

THE newly appointed Compressor and Condensing Unit Industry Advisory Committee held its first meeting December 6 in the Cleveland Hotel, Cleveland, Ohio, according to the Office of Price Administration.

Represented were manufacturers of compressor and condensing units up to five horsepower—parts used in the manufacture of industrial and commercial refrigeration units, OPA said.

Compressors and condensers already are in production, with prices set on an individual firm basis. But a number of firms have not yet applied for reconversion price adjustments, and the advice of an industry committee is needed to complete the job of pricing, OPA said.

The first three members listed below were members also of the Compressor Industry Advisory Committee appointed last year and now superseded by the new and more widely representative committee.

Members are: B. J. Scholl, Brunner Mfg. Co., Utica, N. Y.; Frank Gleason, Copeland Refrigerator Corp., Sidney, O.; Frank Smith, Tecumseh Products Co., Tecumseh, Mich.; Harry Pendergast, Lynch Mfg. Co., Defiance, O.; Sterling Smith, Baker Ice Machine Corp., Omaha, Neb.; George S. Jones, Servel, Inc., Evansville, Ind.; W. F. R Karsten, General Electric Co, Bloomfield, N. J.; H. F. Hildreth, Westinghouse Electric Co., Springfield, Mass.; Harry Hedrick, Mills Industries, Chicago, Ill.

S S S

BOOK REVUE

LESSONS IN ARC WELDING, Seventh Printing, second edition, published by The Lincoln Electric Company, Cleveland, Ohio, 176 pages, 5½ x 8½ inches, 133 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postpaid United States 50 cents per copy, elsewhere 75 cents per copy.

"Lessons in Arc Welding," is a revised and up-to-date new printing of the second edition to assist both new and experienced welders as well as all persons interested or concerned with the subject, with complete and thorough instructions in all phases of arc welding.

The book includes 61 lessons in arc welding and has over 200 photos and illustrations to supplement the text. From the very first paragraphs dealing with "Instructions to the Operator," to the 571 examination questions and answers given in the closing pages, the book sets forth in plain simple language, the practical instruction based on the experiences of Mr. Arthur Madson, head instructor in the Lincoln Arc Welding School.

Season's Greetings

AT THIS season of the year a grateful nation pauses from its labors to give reverent thanks for its first peacetime Christmas since 1940, and to affirm its faith in the fundamental principles of freedom, lighting the whole world without the obscuring cloud of hate and prejudice.

To our R.S.E.S. Members everywhere—at home, and to those still serving their country—we send these Holiday Greetings to you and yours, with the fervent hope that the coming year will bring you much joy and happiness.

H. T. McDERMOTT, *Secretary* C. BUSCHKOPF, *Acting President*

S. B. GARLAND W. W. ALLISON W. W. FARR
C. J. DOYLE J. K. BUSH A. D. McGILL
W. MARSHALL J. L. DRISKELL A. M. PALEN
E. A. SUMMER P. B. REED

COMING CONVENTIONS

RSES Convention
Place: Hollenden Hotel.
City: Cleveland, Ohio.
Date: October 26, 27, 28, 1946.
Secretary: H. T. McDermott, 433 N. Waller Ave., Chicago 44, Ill.

REMA Meetings and Convention
Spring meeting: March 4-5-6-7, 1946.
Place: Stevens Hotel, Chicago, Ill.
Joint meeting with jobbers.

All Industry Exhibition:
Place: Cleveland Public Auditorium.
City: Cleveland, Ohio.
Date: October 28-29-30-31, 1946.
Exec. Secretary: R. Kennedy Hanson, 1107 Clark Bldg., Pittsburgh, Pa.

REWA Meeting
Date: March 4-5-6, 1946.
City: Chicago, Ill.
Exec. Secretary: H. S. McCloud, 920 E. McMillan St., Cincinnati 6, Ohio.

ASHVE 52nd Annual Meeting
Place: The Commodore.
City: New York, N. Y.
Date: January 28-30.
Secretary: A. V. Hutchinson, 51 Madison Ave., New York 10, N. Y.

NEW CHAPTERS IN THE MAKING

Fresno, California

AT A regular meeting of the Refrigeration Service Engineers Association of Fresno, California, held October 8th, it was unanimously agreed that this organization associate itself with the Refrigeration Service Engineers Society and apply for a charter forming a local chapter. At a meeting held November 11th under the direction of W. W. Allison of Los Angeles, the petition for a charter was signed by 28 applicants for membership and forwarded to the International office. The official meeting date of the group was set for the second Thursday of each month. Granting of the charter is now under advisement of the International Board of Directors, and is expected to be acted upon in the immediate future. Temporary officers now serving the groups are: A. H. Brundage, *President;* Ed. Stebbins, *Vice President;* Nat N. Leas, *Secretary;* and C. W. McColm, *Treasurer.*

Greensburg, Pennsylvania

Sixteen men in Greensburg, Pennsylvania, and the surrounding area met and petitioned the International office of the Re-

frigeration Service Engineers Society in June of this year for a charter to form a local chapter. Several formative meetings were held with the first official meeting being held September 25th. On August 4th at a dinner meeting the officers were formally introduced and installed. They are: Joe Curry, *President;* Joe Michaelson, *First Vice President;* Ted Eisaman, *Second Vice President;* Merrill Allen, *Secretary and Treasurer;* Ralph Wesling, *Sergeant-at-Arms;* and Joe C. Hipps, *Educational Committee.* Board of Directors are R. E. Eisaman, *Chairman,* Bob Miller and Don Fisher.

Fairfield County, Connecticut

Men from all parts of Fairfield County gathered recently and resolved to apply for a charter under which a chapter of the Refrigeration Service Engineers Society could be formed. Thirty-four men signed the charter application in October, which was then presented to the International Office.

Waterloo, Iowa

An application for a charter signed by thirteen men in the vicinity of Waterloo, Iowa, was signed and presented in August of this year. The proposed name of the chapter will be Cedar Valley. Several meetings have been held to date and the chapter has thirty-two members whose names are inscribed on the charter.

On November 28th, Clarence Buschkopf, Acting International President, presented the charter to the chapter.

Tampa, Florida

A meeting of refrigeration men in Tampa, Florida, and vicinity was held in the month of November for the purpose of considering the formation of a chapter. In attendance was International Secretary, H. T. McDermott, who explained the benefits to be derived from membership and the formation of a chapter.

Charleston, West Virginia

Thirty men of the Charleston area made formal application for a Charleston charter in the month of September of this year. Since that time several additional men have signed membership applications and granting of the charter is now being considered by the International Board of Directors. Temporary officers elected are Harry G. Frame, *President;* L. E. Von Woglon, *Secretary;* and V. K. Gaskins, *Treasurer.*

R.S.E.S. Chapter Notes

ROCKFORD CHAPTER

Rockford, Ill., Nov. 5—The election of officers was held on this date with the following results: Henry Genin, *President;* E. McDermott, *First Vice President;* E. T. Reynolds, *Second Vice President;* Robert Weygant, *Recording Secretary;* Earl J. Seaton, *Corresponding Secretary;* Harry Lundholm, *Treasurer;* E. M. Cassidy, *Sergeant-at-Arms.*

The Rockford Chapter is now in the process of rebuilding interest and activity and bids fair to be bigger and better than ever. On November 5th a buffet luncheon was served for members and visitors with 34 people in attendance.

TOLEDO CHAPTER

Toledo, Ohio, Nov. 14—Six new members were accepted to membership at this meeting. They were: Max Scott Bonin, Lawrence Richards, Oscar Little, Don Wagoner, Ed Mulligan and Leo Davison.

A business discussion occupied part of the evening during which it was decided that the proposals of the Lincoln Life Insurance Company would not be accepted. The door prize was won by L. Davison. The feature of the evening was a movie presented and explained by Major Ted Frome of the United States Army Troop Transport Command. The movie was both entertaining and instructional.

LONG BEACH CHAPTER

Long Beach, Cal., Nov. 19—Before the meeting, the fifty members and five visitors present enjoyed a luncheon served by the eats committee: Ed Murphy, Earl Langston, R. Bunker and R. J. Sexton.

Two speakers placed important matters before the members. One of these was Mr. Leo Gable of the Long Beach City College, who spoke on apprentice training and made a proposal to the chapter that recommendations be made in order that an adequate program may be set up. The other speaker was W. W. Allison of Los Angeles, who as a member of the national board of directors, gave a report of that board's meeting and also presented the tentative plans of a state organization. The members voted unanimously to join with the other six California Chapters in forming the association.

KANSAS CITY CHAPTER

Kansas City, Kan., Nov. 7—President Ferguson opened the meeting with an explanation that the proceeding of this meeting would be reversed and that the "Educational Hour" would be the first part of the program for the benefit of the speaker of the evening. He then introduced Mr. Max Pehl, who is Secretary-Treasurer of the Kansas City Section of A.S.R.E., and who for many years has had positions in several of our local schools and colleges instructing in ventilation and air conditioning. Mr. Pehl's paper was titled "Short History of Ventilation." He took us back to sixteenth century, and gave examples and references of induced ventilation by Greek Architects; how several architects had made changes in the House of Parliament of England to satisfy the Assembly through the ages. This paper proved very interesting from a historical standpoint.

WYOMING VALLEY CHAPTER

Wilkes Barre, Pa., Oct. 8—Following the business session, the meeting was turned over to Mr. Lodwing of Alco Valve Company who gave an interesting talk on thermostatic expansion valves, suction pressure valves and modulating valves. Considerable discussion among the members followed with questions being answered by Mr. Lodwing.

Mr. Maneval, President, resigned his office in the chapter and has accepted a position with Schonrick Electronics Co. of Sellersville, Pennsylvania. A nominating committee was appointed for the forthcoming election of officers. On the educational program, Mr. Kearney of Ansul Chemical Company presented movies which were enjoyed by the entire meeting.

CORN BELT CHAPTER

Bloomington, Ill., Nov. 17—The meeting was preceded by a banquet called to order at 6:30 P.M. at the Hotel Illinois. The banquet was a celebration of the success of the State Convention to which the chapter acted as host. The speaker of the evening was Richard N. Meyer of Alco Valve Company. Mr. Meyer gave a talk on valves manufactured by his company.

GOLDEN GATE CHAPTER

San Francisco, Cal., Oct. 18—Golden Gate Chapter has been holding meetings since April of this year with steadily increasing activities and a steady growth of membership. On this particular date the business session occupied the first part of the evening followed by an educational program, the principal speaker of which was Bill Lee of General Electric Company. Mr. Lee gave an interesting talk on preventative maintenance on fractional horsepower motors.

Nov. 8—After the business session was disposed of, W. H. Ball, Lubrication Engineer, Texaco Oil Company, gave an interesting talk on lubrication. This important subject proved highly interesting to the members who devoted sometime to discussion and questions following the presentation.

PROVIDENCE CHAPTER

Providence, R. I., Nov. 7—This is the first meeting of the winter season and the first order of business was the annual election of officers. Those elected are: ***President,*** Peter Miller; ***Vice President,*** William Ralston; ***Second Vice President,*** Arthur Doucet; ***Secretary and Treasurer,*** Hallam Richardson; ***Sergeant-at-arms,*** George Martin. The monthly meeting dates were changed from the second Wednesday of the month to the first. The balance of the evening was devoted to business matters.

TWIN CITIES CHAPTER

Minneapolis, Minn., Nov. 6—During the business session the entertainment committee reported on arrangements being made for the future dinner and dance. Henry Sundgaard reported on the progress on the proposed St. Paul City Ordinance. George Solberg was accepted as a Junior Member. On the educational program, Ted Hartman of General Mills presented an interesting demonstration on three stage refrigeration.

CHICAGO CHAPTER

Chicago, Ill., Nov. 13—During the business session of the evening, Ed Riccio reported on arrangements completed thus far for the banquet to be held sometime in January. Considerable discussion arose on the matter and committees were appointed to carry on the work. The chapter discussed the advisability of buying a motion picture projector, with R. L. Hendrickson being asked to investigate the possibilities. Dwight D. Orr, educational chairman, introduced the speaker of the evening, F. R. Weirman, Chicago Seal Co., who gave an instructive talk on the Chicago Seal products.

HOUSTON CHAPTER

Houston, Texas, Nov. 13—Mr. Daniels proposed formation of a bowling team to represent the chapter in the local bowling league. Mr. Arbuckle, the speaker for the evening, gave an educational talk on maintenance of motors. Following the adjournment of the meeting, coffee and doughnuts were served by Mr. Daniels, and a film depicting the ten cardinal points of salesmanship was presented by Mr. Kellett.

READING CHAPTER

Reading, Pa., Nov. 20—After a short business meeting the educational committee took over and introduced Mr. Christman of the Christman Ice Cream Co. of Hamburg, Pa. Mr. Christman and his associate showed movies on the manufacture of ice cream and allied products. Another movie was shown called "On The Air" made by The Westinghouse Mfg. Co. This picture was very interesting and showed how radio broadcasting first started over KDKA in Pittsburgh, Pa., in 1920 and showed the improvements over a period of time until the present date. Another movie was shown just released by the U. S. Government showing how our battleships found the enemy at night and destroyed same with the aid of "Radar." Mr. Christman served some of his delicious ice cream after the meeting.

TRI-STATE CHAPTER

Huntington, W. Va., Oct. 9—James Thacker gave an interesting talk on his experiences while in the armed services. Mr. Ward was the holder of the lucky number winning the jackpot prize. Following the meeting, many of the members went to the home of Mrs. Brunton where the ladies were meeting and were served sandwiches and coffee by the hostess.

COLUMBUS CHAPTER

Columbus, Ohio, Nov. 14—The meeting was attended by over 50 members who were entertained by the speaker of the evening, W. S. Smith of the Johns Manville Co. Mr. Smith presented motion pictures on heat, then followed this presentation with a talk on insulation, which proved highly interesting. Lunch was served after the meeting was adjourned.

ST. LOUIS CHAPTER

St. Louis, Mo., Oct. 16—President Braun called the meeting to order and introduced the speaker, Dr. Arthur L. Hughes, Professor of Physics at Washington University. His lecture, though not on refrigeration, was one which was highly informative to all members. He began his talk by explaining the structure of the atom and the process of cracking it to release the energy stored in its nucleus. He next went into the principle of the atomic bomb and explained how St. Louis having the only underground cyclotron here in the United States was fortunate to have been quite instrumental in laying the groundwork for the bomb development. He talked of the cyclotron, its uses in the present and for the future; its possibilities in the field of medicine and other sciences, how it could give radio-active powers to many common elements which could then be used in the treatment of many diseases just as radium is used today.

He then opened the meeting to a question and answer period; during which time he explained the location where the major natural resources of materials for use in the atomic bomb were found; the practicability of drying machinery with this power; its percentage of efficiency, etc.

WATERBURY CHAPTER

Waterbury, Conn., Nov. 7—It was a gala occasion for the charter presentation. Master-at-Arms Daniel LaPorta called the roll and with the exception of Mr. Senkus of Bethlehem and Robert Whiteside, all members were present.

After a few remarks from the chair we opened under new business and President Peffers called on Acting President Mr. Buschkopf of the International Society to present the charter.

Before the meeting was called to order at the start we were served an excellent turkey dinner that was enjoyed by all. We had thirty out-of-town guests and thirty-two local members and their guests. Among the out-of-town guests were three from Bridgeport, nineteen from Hartford, eight from New Haven and one from Providence. These included Vice-President Garland of the International Society who drove over from Providence with Mr. Buschkopf, and Secretary Lee Wallace of the New England Association.

25 lb. pail illustrated.

The Ideal Dehydrant for Refrigerants

JAY CEE refrigeration gel is one of the most efficient dehydrating agents. It is especially prepared for dehydration of refrigerants, and may confidently be used for drying Freon, Methyl Chloride, Sulfur Dioxide or any other similar agent. Removes acids, prevents rust or corrosion and is not affected by oil. The special particle size retains its crystalline structure—assuring uniform distribution in the cartridge and complete contact with all pore surface areas.

We offer you this economical 25-lb. container with resealable Easy-Pour spout. Dehydrators can easily be filled from this Easy-Pour container, and resealed to protect unused contents until needed. Special gasketed cover makes Easy-Pour container air-tight when not in use.

This highest quality product is also available in 1-pound, 5-pound, and 10-pound resealable metal containers, and in 100-pound bulk drums which can easily be sealed air-tight after use.

There are excellent opportunities for jobbers and distributors to develop profitable business on Jay Cee Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD., INDUSTRY AVENUE, JOLIET, ILLINOIS

JAY CEE **SILICA GEL**

A superior dehydrant

ONTARIO MAPLE LEAF CHAPTER

Ontario, Can., Oct. 19—Mr. Harold Donnell presided over the meeting held in the King Edward Hotel. Art Doan, educational director of the chapter, introduced Mr. I. M. Bodine, Executive Engineer of the Canadian Ice Machine Co., Ltd., who spoke on the subject "refrigeration units, components and design, as applied to load conditions." His talk was exceedingly well presented and thoroughly enjoyed by all those present. J. W. McKee extended to Mr. Bodine the appreciation of the chapter and all those present for the splendid address and thanked him for his time and effort in appearing before the chapter. Mr. Bodine also provided informative literature of which the membership was invited to avail themselves. Three new applicants for membership were accepted. They were Norman L. Bell, Edward R. Baer, and Carl G. Heilig. During the business session of the evening, Mr. Marshall Lock suggested that another meeting be held in Hamilton and thought that the second stag night of the winter session would be a nice occasion for the meeting. It was suggested that the Niagara Frontier Chapter of Buffalo be invited to attend. Other business matters occupied the balance of the meeting.

MOUNT ROYAL CHAPTER

Montreal, Quebec, Nov. 2—This was the occasion of the annual oyster party of the Mount Royal Chapter held at the Cafe St. Jacques. This get-together of members and friends proved to be everything that the connoisseur could expect with oysters that were excellent, plenty of liquid refreshment and a floor show that included Godiva, less her horse. Mac Turner, of Motor Repair Ltd., not forgetting his oyster knife and was it in great demand. Joe (Stalin) Bastien, of City Refrigeration, discussing the postwar situation and saying "Didn't I tell you the Russians could do it." Ross Turner of Kelvinator, believing that Toronto is the only city in the world.

Nov. 15—The meeting was called to order by the President, C. A. Fabien, Mr. Gordon Roe of Canadian Industries Ltd., introduced the speaker of the evening, Mr. R. J. Thompson, of Kinetic Chemicals, Inc. After giving a very interesting and enlightening talk on "Freon" Mr. Thompson answered questions pertaining to some of the everyday problems that the refrigeration service man encounters, the business of the Chapter was then taken up.

MONUMENTAL CHAPTER

Baltimore, Md., Nov. 27—On the educational program, Fred House of the Mueller Brass Co., gave an interesting talk and demonstration on the correct method of soldering. Mr. House expressed regret that the part situation was such on sweat fittings that he was unable to let members try their hand at soldering, but promised that as soon as fittings became available and if the members wished it he would return with enough material for a general demonstration.

SAN DIEGO CHAPTER

San Diego, Cal., Nov. 15—With a good attendance of members and refrigeration men from the local Naval and Marine establishments, the meeting was called to order by President French. Several important items of business were transacted. The Constitution and By-Laws Committee presented their completed report, and after a reading and discussion, the Chapter Constitution and By-Laws were adopted as read. Of equal importance was the nomination for officers for the coming year. After some lively discussion, the lists were ordered closed for the evening. A committee was appointed to obtain a permanent meeting place, since the meeting room we have used for the past year through the courtesy of the Anderson Refrigeration Service, is to become part of the large display floor planned by Mr. Anderson.

After the business of the evening was concluded, Mr. K. H. Young, a member of the Chapter, gave us a very interesting talk on his experiences in installing a deep-freeze room in the Merchants Refrigeration Company building in New York City some years ago. After the meeting, sandwiches and refreshments were served.

DAYTON CHAPTER

Dayton, Ohio, Nov. 8—Upon the suggestion of the Secretary and unanimously agreed, that the dues of Ralph McCandlish, a returned veteran and a former member of the Columbus Chapter be paid from the chapter's treasury. The educational feature of the evening consisted of a discussion of some of the problems of commercial refrigeration.

Nov. 29—There was quite a long business session during which the nominating committee was appointed to present a slate of officers for the first meeting of the year. Open discussions on service problems occupied the educational period and a report was given on the forthcoming Christmas party to be held in December.

BOSTON CHAPTER

Boston, Mass., Oct. 9—F. Y. Carter, Detroit Lubricator Co., was the speaker on the educational program who explained and showed the progress of the Thermostatic Expansion Valve. Business occupied the balance of the meeting during which the following members were admitted to membership: Anthony Magliaro, Howard O. Wilber, Harold E. Anderson and William R. Hein. In addition an application for Junior Membership was received from Robert Traynor.

Nov. 13—A very interesting and instructive demonstration on silver brazing and light gas welding was presented by H. S. Haywood. Messrs. J. Lawrence Hall and James McCue were appointed on the nominating committee, and following the meeting refreshments were served the membership.

* * *

News From— The Dispatcher

ALEX GORDON, former secretary of Chicago Chapter R.S.E.S., is planning on moving to California where he will seek employment in the refrigeration field.

J. M. Gantt, Montgomery, Alabama, has been released from the Army Air Forces and is again doing refrigeration work.

Kenny Young, El Centro, California, one of the most popular members of the San Diego Chapter, has had to quit working for some time because of an eye infection. The infection was contracted while working on Navy ships returning from the tropics which carry almost every kind of "bug" known.

John H. Hudgens, now on terminal leave as Major in the Army Air Forces is to be president and general manager of the newly formed Electrical Appliance Company, Albany, Georgia. The company has been granted the franchise for 24 counties in Southwest Georgia by the York Refrigeration and Air Conditioning Company. Other officers include John W. Crouch, vice president, and Mrs. Edith Stubbs, treasurer.

F. H. TISON

F. Harry Tison, formerly with Tison Refrigeration Co., Albany, Georgia, is discharged from the Navy after three and a half years. Twenty-five months of this time he spent in the South Pacific Islands installing and maintaining the refrigeration equipment so necessary to the armed forces. For the past year Tison has been stationed at Camp Parks, California, in charge of refrigeration instruction. He is back in Albany now operating under the name of Bonded Refrigeration Company.

The Advanced Refrigerating Company has recently been opened at 645 South Seagrave Avenue, Daytona Beach. It is conducted by George Brasen and W. E. Townsend. Brasen served in the Marines; Townsend in the Army.

T. E Williamson has opened the Refrigeration Service at 105 North Lincoln Avenue, Lake Wales, Florida.

Floyd W. Pelton and Virgil L. Pool have published a certificate that they are conducting business under the firm name of Glendale Refrigeration Sales and Service, at 429 South Central Avenue, Glendale, Calif.

The Golden Rule Electric Shop has negotiated a long-term lease on a modern five-story fireproof building at 116 West Seventh Street, Cincinnati, Ohio, in the midtown retail shopping area. The street floor of the new unit will contain a modern display section, parts department and executive offices. The second floor will have complete service department with expanded line of merchandise. Upper floor will be devoted to sales and display rooms, including kitchen cabinets, heating equipment, furniture, refrigerators, radios, air-conditioning and other home appliances.

Building permit has been issued for construction of a store and office building, 100 x 54 feet in area, at 7003 South Western Avenue, Los Angeles, California, for the California Refrigerator Repair Shop, Inc., at a cost of $42,000.

Frederick A. Martzolf has filed a business name in Buffalo, N. Y., for the Martzolf Refrigeration Service, 5 Humphrey Street.

KEROTEST

TURN TO YOUR JOBBER *first and always*

KEROTEST
VALVES · FITTINGS
AND ACCESSORIES FOR THE
AIR CONDITIONING and
REFRIGERATION INDUSTRY

FOR THESE
Very Good Reasons

- **TRAINED SALESMEN**
  You'll find no *ribbon clerks* at your Kerotest jobbers—every man is a hard-working, hard-hitting salesman, completely schooled in technical "know-how" and product knowledge. He's a very helpful fellow—ready to aid you on any problem.
- **NEW PRODUCT INFORMATION**
  Your Kerotest jobber is well informed, in advance, on new developments, new products and new ways to use time-proven items. The frequent contacts between jobber and buyer promote more up-to-the minute knowledge and early use of these new ideas.
- **TECHNICAL KNOWLEDGE**
  Your Kerotest jobber's technical knowledge is the result of many years experience—it is not confined to a single line or product but to the broad needs and requirements of his customers.
- **LARGE INVENTORY STOCKS**
  Your Kerotest jobber has a strong purchasing power—and in these abnormal times is able to procure the "almost" impossible items you need so badly. Under normal merchandising conditions his stocks are large and ample.
- **EFFICIENT PERSONNEL**
  Your Kerotest jobber's staff is trained to recognize every opportunity in which they can provide SERVICE—more efficiently and promptly—to give intelligent information, quickly and courteously
- **FAST DELIVERY**
  In these difficult days, your Kerotest jobber provides a quick and systematic delivery service—so that little time is lost, and for postwar his service will be *even faster.*
- **HELPFUL AID**
  Turn to your Kerotest jobber *first and always* for the most accurate and up-to-the minute product information, for help on your toughest problems.

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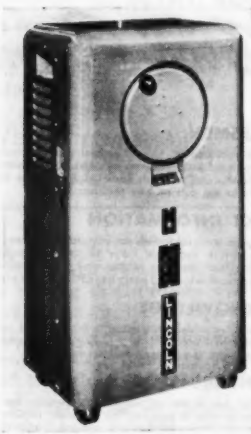
New and Improved Appliances

Addresses of Manufacturers represented in this department can be obtained from the Editor

New Low-priced Welder

A NEW low-priced welder which is ideal for rural power lines and is said to overcome all the objectionable features of previous welders designed for this type of service has just been announced by The Lincoln Electric Company.

The new unit, called the "Fleet-Arc Jr.," is for 230 volt, single phase power lines and meets the limited input requirements of rural Utilities and REA by a design of high efficiency and high power factor. It has a maximum input current of 35 amperes and provides a machine which meets the new NEMA standards for this type of welder. It can be used with the standard 3-KVA power transformer provided by the power company. Current range is from 20 amperes at 20 volts to 180 amperes at 25 volts welding duty. This gives sufficient capacity for all types of jobs found on most farms or job welding shops. It will handle electrodes ranging from 1/16" to 5/32" diameter.



"Fleet-Arc Jr." Welder

The "Fleet-Arc Jr." which simplifies welding and multiplies its utility for repair and fabricating jobs done by farmers and average mechanics, inaugurates a revolutionary development known as the "Arc Booster" which provides quick, easy arc starting. The instant the electrode touches the work, the welding current is given a boost of intensity for starting the arc.

The current then reverts automatically to the amount set for the job. No high voltages or special high frequency devices are used, the output voltage being limited to a maximum of 52 volts.

Either of the two degrees of arc boosting provided is selected by a snap switch, one for general work and the other lower amount for thin material such as automobile fenders.

Current control for the new "Fleet-Arc Jr." is of the separate adjustable reactance type which is varied by turning a hand wheel. Adjustment is continuous over entire welder range of from 20 to 180 amperes.

Design and construction features of the new welder include:—

Wear-free and vibrationless reactor current control with self-cleaning chain drive. No taps or plugs to develop loose connections.

Heavy copper winding with spun glass insulation and mica coil separators. Arc welded steel frame and housing.

"Fleet-Arc Jr." weighs only 360 pounds and is, therefore, readily portable.

Cutting Tool Grooves Plaster

A NEW machine, looking much like an electric buzz saw attached to the end of a vacuum cleaner hose, has been introduced to the field by Minneapolis-Honeywell Regulator Co.

Capable of cutting precise channels in plaster walls, the unique portable "saw" with tungsten carbide teeth was said by the company to make possible installation of heating controls in apartment heating systems without the costly and time-consuming restoration and redecoration which heretofore have been necessary to all such jobs.

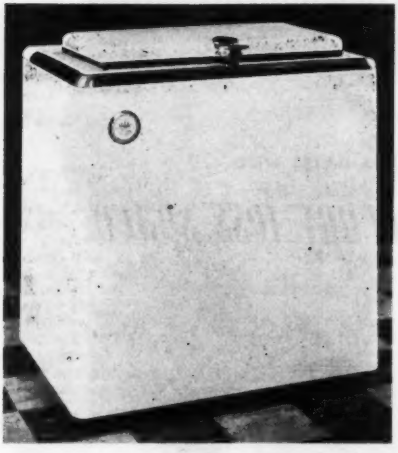
In a demonstration for the press Balch rapidly cut a groove in a hard plaster wall, the tool "inhaling" the dust in its own vacuum cleaner. Balch then showed how the necessary copper tubing is buried inside this groove in the wall and then covered with a special plastic filler and masking tape so that the finished job is unnoticeable.

The complete job of burying the tubing, mounting a thermostat, and installing a valve should take no longer than an hour.

A new tool for cutting grooves in plaster

Frigidaire Home Freezer

THE Frigidaire Division, General Motors Corporation, Dayton, Ohio announces the first of its contemplated home freezers, a four cubic foot cabinet or horizontal model. This cabinet is in a finish of white baked enamel.



The new Frigidaire home freezer

The outer dimensions of this cabinet are: height, 36" to the top of the cabinet; length, 34½"; and width, 24". The storage space is 12⅝" wide by 24 5/16" long by 23" deep, thus giving slightly more than four cubic feet of storage space in the cabinet. The total weight of the freezer is 250 pounds and it is operated by the Meter-Miser unit of 1/9th horsepower with slightly less than 1½ kilowatts of electricity in a normal room temperature for a period of 24 hours.

Officials of Frigidaire believe that this and other freezers planned for future production will be available to the public shortly after January 1, 1946. Present plans call for an 8 cubic foot cabinet model, an upright model, with a capacity of 5.1 cubic feet and a "Super-Freeze" chest in the deluxe Frigidaire refrigerator, in addition to the 4 cubic foot model, thus presenting home freezers in forms that will meet the requirements of the public.

Blue Flash Coolers Return

THREE brand new models of the Blue Flash Refrigerator now are being offered by The Brunswick-Balke-Collender Company, Chicago, Illinois.

Largest of these food and beverage refrigerators is the Model T. Its 3-compartment cabinet will accommodate an amazing amount of bottled goods or solid foods. One shallow and two deep tanks provide a total of 25¾ cubic feet of storage space that can be divided between dry and wet refrigeration to suit the users' requirements. The Model T makes maximum use of minimum floor space, being only slightly over 7 feet long.

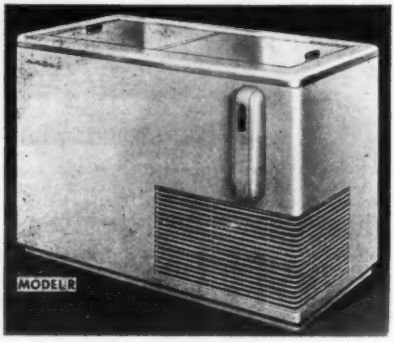
For installations requiring less storage capacity, the Model R, with one deep and one shallow tank, provides 15.4 cubic feet. This unit fits into a space just over 5 feet long. The shallow tank may be used for either dry or wet storage, while the deep tank adds great flexibility to the unit because of the various rack and shelf arrangements for which provision is made.

The third Blue Flash unit is the Model N, whose two shallow tanks provide 9.6 cubic feet of storage capacity. In this model, both tanks may be used for dry or wet beverage cooling or one may be used wet and one dry. A floor space just over 4⅛ feet long will accommodate the Model N.

Blue Flash liquid and solid food refrigerators always have featured a direct expansion refrigeration system with 5-sided application of the cooling coils. Coils are soldered directly to tank walls to provide conductive cooling, the result being more uniform temperature maintenance and superior dry sanitary refrigeration within the tanks.

Blue Flash cabinet insulation is hermetically sealed to guard against damage from moisture or vermin. Effectiveness of the insulation also is increased by this type of construction.

The deep tanks embodied in the two larger Blue Flash models make these units surprisingly versatile. Maximum capacity in minimum floor



Brunswick-Balke beverage cooler

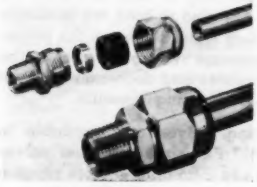
space is provided by this feature without affecting the accessibility of any part of the unit.

All Blue Flash refrigerators have easy-sliding lids of stainless steel, stainless steel tops, rubber-covered lid stops, modernizing compressor grill, large detachable bottle-cap receptacles, massive electrically-welded steel frame, heavy-gauge, rust-proofed steel wrapper and a thoroughly dependable, fully guaranteed commercial compressor unit.

Soon to join the Blue Flash line are two sizes of Frozen Food Storage Refrigerators. These units will bring to their field the same principles of good refrigeration engineering that distinguish all Blue Flash refrigerators.

Flexigrip Tubing Fitting

FLEXIGRIP time-saving tubing fittings which eliminate end preparation or soldering of the tubing and yet produce a stronger, leak-proof and flexible joint have been announced by Gustin-Bacon Manufacturing Company of Kansas City, Missouri. The Flexigrip fitting, made in standard sizes from ⅛" to 1½" O.D., consists of four parts—the body, a gripping ring, synthetic rubber



Flexigrip coupling

gasket and nut. To attach the fitting, the nut (with gasket and ring inside) is slipped over any plain-end tube, cut to desired length. The tubing end is inserted into the body as far as it will go and the nut tightened. Tightening the nut compresses the ring into a tight grip and moulds the gasket around the ring for a leak-proof seal that is so flexible it will withstand unusual vibration or impulse.

Elimination of flaring, swedging, or soldering, the tube end adds considerably to the strength of the joint as well as saving time and labor. Economies in time and material are also considerable over the collar, ring or ferrule type of tube-end fitting. The time-saving factor and the resulting stronger joint should give the new Flexigrip fitting ready acceptance, especially in tubing applications where vibration or leakage are important considerations.

Flexigrip tubing fittings are available in brass, aluminum or steel.

Adjustable Capillary Tube

THE Floco Flotube is recommended for use in connection with fractional horsepower, single circuit refrigerating systems which use either Freon, Methyl Chloride or Sulphur Dioxide as a refrigerant.

It imparts such an accurate control of refrigerant that its use is widely indicated where economy in initial expenditures and continuous trouble-free operation are prime requisites.

The operation of the tube is very simple. It has neither valves nor stuffing boxes to get out of order and is externally adjustable. It is simplicity itself.

The Flotube is connected in the liquid line by means of ordinary flared fittings. The expansion of the refrigerant is controlled in this way: Mounted on the tube is a choke collar which is controlled by the tightening action of a choke nut. When the nut is drawn up, it results in a uniform pinching of the copper tubing until

Floco Flotube

the desired expansion valve effect is obtained. This special design, for the first time, imparts to a refrigerant expansion tube an accuracy of control adjustment heretofore believed impracticable.

The tubes come in two different models which fit all jobs from ⅛ hp. up to 1 hp. They are equipped with a large self-contained strainer to eliminate clogging.

Flotubes are manufactured by Flow Controls, Inc., 1821 W. North Avenue, Chicago 22, Illinois.

New Air Duct

A NEW material, "Airtron," created during the war for aircraft heating and ventilating, is now available for other manufacturers as a ducting for hot or cold air.

Airtron for air ducts

Made of glass cloth and rubber, it provides very high insulation qualities as well as great flexibility. The flexibility makes its use very desirable where vibration is present, for it will operate indefinitely under conditions where metal ducting would develop fatigue cracks. Tests indicate that the heating, ventilating and air-conditioning of future planes, trains, automobiles, buses and homes will use a great deal of Airtron.

It withstands temperatures from minus 60 degrees F. to 300 degrees F. without a change in properties and will stand well over 50 pounds per square inch internal pressure at all temperatures. It is unaffected by air, light, water, gasoline, oil and all but concentrated mineral acids. Manufactured in tubes from 1 inch to 6 inches in diameter and in any length desired, as well as in specialized shapes where required for unusual installations, the ducting can be adapted to any equipment as a replacement or as an original installation.

Airtron is made only by Arrowhead Rubber Company. Its research men are now working with a number of manufacturers who are desirous of employing this versatile material in their products and processes.

Major Arthur S. Alter, just returned from Germany, receiving delivery of the first 1946 Ford car delivered in the Chicago area from Harry M. Lucas. Major Alter after his discharge will resume his prewar job of Vice President and manager of the Radio and Appliance Division, Harry Alter Company, wholesale distributors of Crosley products in Chicago.

FROZEN FOOD LOCKERS

STUDENTS, returning servicemen, teachers, and others interested in the frozen food locker industry as an occupation will find helpful information in a six page leaflet entitled *Frozen Food Lockers* just published by Occupational Index, Inc., New York University, New York 3, N. Y. Single copies are 25¢, cash with order.

This is one of a series of 75 such leaflets describing opportunities in 75 different occupations. Each one covers the nature of the work, abilities and training required, earnings, entrance and advancement, and miscellaneous advantages and disadvantages.

S S S

DU PONT HAS NO INTEREST IN I. G. FARBEN

E. I. du PONT de NEMOURS & CO. issues the following statement:

Recurring reports from Germany giving the impression that the Du Pont Company is a substantial stockholders in I. G. Farbenindustrie are entirely incorrect. The Du Pont Company has no investment whatever in I. G., or any of its subsidiaries.

The latest of these reports is a statement attributed to Colonel Edwin S. Pillbury, identified as Farben Industry control officer.

The only stock interest Du Pont ever had in I. G. Farben, in fact, came as a result of an investment of $1,785,522 made in 1925 in the stock of two German explosives firms, Dynamit A. G. and Koln-Rottweil, which later were merged with or came under the control of I. G. The Koln-Rottweil shares were converted into I. G. shares. The investment was later increased, by the exercise of purchase rights, to a total of $2,395,816, which was approximately one-half of one percent of the issued shares of that company.

Du Pont began disposing of its investments in I. G. in 1933. Sale of its whole remaining I. G. investment was authorized by Du Pont in 1934. This proved difficult because of currency regulations and blocked mark requirements. The I. G. stock was, however, fully disposed of in 1940, at a loss of $671,406, and the Dynamit A. G. shares, sold at the same time, were liquidated at a loss of $534,359.

S S S

N. M. DUNNING TO REPRESENT SUPERIOR VALVE & FITTINGS

N. M. DUNNING has recently been appointed factory representative for Superior Valve & Fittings Co. and will be responsible for sales in the territory including the States of Kentucky, West Virginia, Ohio, Eastern Michigan, Western Pennsylvania, Western New York and Eastern Canada.

N. M. DUNNING

His early experience was in the architectural and construction fields. Leaving this industry, he turned to refrigeration and air conditioning, and later joined the General Electric Company. During the 1930's he conducted a number of the G. E. Air Conditioning Institute training schools and was in charge of engineering and sales in Chicago and Cleveland. He later became Eastern District Representative for the White-Rodgers Electric Company, specializing in air conditioning and refrigeration, electrical and hydraulic control work. Since the outbreak of World War II and until the

present, Mr. Dunning served with the Philadelphia Ordnance District as Chief Supervisor of Production Personnel Training, Deputy Director of Production and Acting Director of Production, in successive order.

He will make his headquarters at the factory in Pittsburgh, Pa.

W. D. WOOD BACK WITH G. E.

WALTER D. WOOD has been appointed assistant to the manager of the appliance distributing branches of the General Electric Company, it has been announced by P. A. Tilley, manager of the branches.

A graduate of the University of Oklahoma, Mr. Wood joined G.E. in 1934, and has held positions in Schenectady and Bridgeport. Since 1941, when he entered the Army as a first lieutenant, he has served in the offices of Chief of Ordnance, of the Under-Secretary of War, and of Fiscal Directory Headquarters, in Washington, D.C. At the time of his release from service, he held the rank of lieutenant-colonel.

T. W. BINDER CO. TO CHANGE NAME

AS OF January 1, 1946, T. W. Binder Co. will change its name to Tesco Distributors, and will remain under the exclusive ownership of Theodore and Sidney Yecies.

Keeping in trend with the times and looking to the future, they have purchased a lot 100 x 100 on which will be erected a modern structure, exclusively for their use.

Tesco Distributors will handle only refrigeration and air conditioning parts and supplies, catering to dealers throughout Northern Jersey.

HONECKER WITH BORDEN

A. E. BORDEN CO., Boston jobber, announces the addition of Norman C. Honecker to its staff in the dual capacity of refrigeration engineer and sales representative. Mr. Honecker is a graduate of Rensselaer Polytechnic Institute and was associated with Buffalo Forge Co. for five years and with the Fedders Mfg. Co. of Buffalo, N. Y. for twelve years. While with Fedders, he was engaged in laboratory research and development on their line of expansion valves, unit coolers and gravity coils, later taking charge of their Boston factory branch. Mr. Honecker will travel the Maine and New Hampshire area with a portion of Eastern Massachusetts for A. E. Borden Co.

F. L. RIGGIN OF MUELLER LIKES WESTERN STATES

FRED L. RIGGIN, JR., General Sales Manager of the Mueller Brass Co. has just completed an extensive tour of the Company's West Coast Sales Offices and Warehouses.

F. L. RIGGIN

During his trip, Mr. Riggin had an opportunity to meet a number of business leaders in these territories. He brought back with him a distinct impression of the enthusiasm held by those with whom he talked. This enthusiasm finds expression in expanded operations which in a great many cases involves extensive construction programs backed by intelligent business planning.

"I was impressed with the caliber of businessmen in the Western States, with their energy, their ideas, and enthusiasm for their section of the country," states Mr. Riggin.

The Mueller Brass Co., with general offices and plant in Port Huron, Michigan, manufactures the famous STREAMLINE Copper Tube and Solder Type Fittings, Brass, Bronze and Aluminum Forgings, and Screw Machine Products, as well as a complete line of Refrigeration Products used by most of the leading manufacturers of commercial and domestic Refrigeration and Air Conditioning units.

EXPERIMENTAL STORE IN KALAMAZOO, MICH.

A NEW type of experimental store will be set up by Kalamazoo Stove and Furnace Company in the recently purchased Bates Building, in the center of Kalamazoo's business district, Kalamazoo, Michigan, according to Arthur L. Blakeslee, president.

The store, planned by Jack Morgan, Chicago designer, will serve as an experimental establishment where methods of display, merchandising plans and other phases of retail distribution will be tried out before being installed in retail stores. A model busi-

ness accounting method — developed within Kalamazoo's own branches during pre-war years—will be set up for study. Display units for large and small stores will be worked out. The model outlet will promote and sell the company's full line of stoves, refrigerators, washing machines, heaters and furnaces.

Model kitchens in basic kitchen types will be built and completely furnished according to a "work center" plan in which storage and work space allotment is broken down to fit kitchen functions. The cooking center, for instance, includes—besides the stove—room for storage of cooking utensils, spices and other staples used in cooking, counter space for filling plates right at the stove.

One floor of the new building will be turned into a sales training school for members of its selling staff, branch managers and franchise dealers. Here a home economist will demonstrate cooking methods in one of the model kitchens.

NEW SCHAEFER DISTRIBUTORS

SCHAEFER, INC., exclusive manufacturers of low temperature cabinet equipment since 1929, has announced the appointment of 61 distributors whose franchises cover the national field. Included in the Schaefer line are Pak-A-Way home and farm freezers and Schaefer ice cream and frozen food cabinets.

Taking the wraps off postwar manufacture, Schaefer is now in production of its three low temperature cabinet groups, according to Harold L. Schaefer, president of the Minneapolis concern. During the war, Schaefer produced special low temperature equipment for the armed services.

New distributors of the Pak-A-Way home and farm freezers include: Lockie & Glenn, Cincinnati; Lone Star Wholesalers, Dallas, Tex.; the Shield Co., Fort Worth, Tex.; Charles R. Bowman Co., Grand Rapids, Mich.; Jules Alexandre, Inc., Harrisburg, Pa.; Southwest Furniture, Ltd., Houston, Tex.; Refrigeration & Electric Supply Co., Little Rock, Ark.; Foster Distributing Co., Louisville, Ky.; Wayne Spinks Co., Memphis and Nashville, Tenn.; Clark Supply Co., Milwaukee, Wis.; General Electric Supply Corp., New Orleans, La.; and the T. S. Ponthan Co., San Antonio, Tex.

New distributors of Schaefer frozen food cabinets include: B. F. Austin & Son, Abilene, Tex.; Doherty-Stirling, Inc., Baton Rouge, La.; W. A. Case & Son Mfg. Co., Buffalo, N. Y.; H. E. Humphreys, Concord, N H.; Vernon C. Frederick, Houston, Tex.; Passman Equipment Co., Monroe, La.; A. F. Briggs Co., Portland, Me.; Cable-Wiedemer, Inc., Rochester, N. Y., and Scranton Supply & Machinery Co., Inc., Scranton, Pa.

New distributors of Pak-A-Way freezers and Schaefer frozen food cabinets include: Charles S. Martin Distributing Co., Inc., Atlanta, Ga.; Legum Distributing Co., Baltimore, Md.; Gross Distributors, New York, N. Y.; M. L. Foster Co., Oklahoma City, Okla.; Thomas Blackett Co., Detroit, and the C. H. Malcolm Co., Seattle.

New distributors of Pak-A-Way freezers and Schaefer ice cream and frozen food cabinets include: Electric Appliances, Inc., Indianapolis, and the El Paso Hotel Supply Co., El Paso, Tex.

HONEYWELL FORMS NEW DEPARTMENT TO HANDLE SPECIALIZED CONTROLS

FORMATION of a Specialties Division to handle sales and production of special products has been announced by John E. Haines, manager of Commercial Control Sales, Minneapolis-Honeywell Regulator Company.

MARTYN KINGSLAND

Martyn Kingsland, manager of the company's refrigeration controls division, has been named sales manager of the new department, Haines said, and will consolidate the activities of his former department with the new division and expand personnel accordingly. The new division also will handle modification of the company's regular heating and air conditioning controls for special applications and, therefore, speed production and delivery of instruments which must be made slightly different from standard products as well as the development and sale of new products to meet the particular requirements of specialized applications.

In the immediate future, Haines said, the Specialties Division will handle the sale of refrigeration controls, mercury switches, remote bulb thermometers, combustion con-

trols, special control panels, special relay applications and temperature and pressure alarm systems. Other special applications of existing and new controls for Diesel engine and associated fields will be added in the near future.

H. A. MALCOM NOW SALES MANAGER OF CHRYSLER

D. W. RUSSELL, president of Airtemp Division, Chrysler Corporation, announced today the appointment of H. A. Malcom, formerly assistant general sales manager, to the position of General Sales Manager.

H. A. MALCOM

Mr. Malcom has been with Chrysler Airtemp for five years and has held several sales executive posts. He was Regional Sales Supervisor in charge of the Southern half of all U. S. markets before he became assistant salesmanager. As General Sales Manager, he will now administer the entire postwar sales program on Chrysler Airtemp's "triple line" of air conditioning, heating and refrigeration products.

Prior to his association with Airtemp, Mr. Malcom held sales executive positions with nationally known manufacturers of large volume products, such as automobiles, electric refrigerators, and electrical appliances. He served in the U. S. Army in World War I.

Mr. Malcom was born in Logansport, Indiana, and attended grade school and preparatory school there before moving to Chicago to attend Northwestern University. He makes his home in Dayton, where Chrysler Airtemp is headquartered.

ROBERS OF WEATHERHEAD TO PROMOTE AIRCRAFT SHOW

GENE P. ROBERS has been appointed Vice President in Charge of Publicity and Promotion of the National Aircraft Show to be held in Cleveland, Ohio, January 11 to 20, 1946. Robers is Sales Promotion Manager of the Weatherhead Company of Cleveland and has been given a ninety-day leave of absence by his company to head up the promotion of the huge aircraft show.

The National Aircraft Show will attract national attention, being the first such show since 1939.

"This will be the largest aircraft show in history. With the endorsement and cooperation of General H. H. Arnold and the Army Air Forces, this show will portray to the public and aviation industry of the nation, all of the war weapons and equipment plus all of the new planes and equipment for the coming air age," Robers said.

Extensive equipment of the Army Air Forces at Wright Field will be on exhibition as well as captured equipment from all theatres of war. Complete facilities of the large Public Auditorium at Cleveland will be taxed to capacity to house all of the exhibits.

GENERAL CONTROLS APPOINTS DIVISIONAL SALES MANAGER

THE appointment of J. M. Schlemmer as Divisional Sales Manager of the Refrigeration Division was recently announced by Mr. J. F. Ray, Director of Sales, General Controls Company, Glendale, California. In this capacity he will contact all original equipment manufacturers, jobbers and dealers in coordination with the branch office personnel in the use and sale of the refrigeration line of automatic control equipment.

J. M. SCHLEMMER

Mr. Schlemmer comes to General Controls with a very versatile background of 20 years experience in the refrigeration field. Starting with Frigidaire in 1925, as field and service engineer, he later was associated with a California refrigeration jobber organization. In 1938 Mr. Schlemmer and associates started manufacturing deep freeze boxes and allied equipment. This business was terminated by the war in 1941. He has also been associated with General Electric Company in their air conditioning and refrigeration divisions.

Mr. Schlemmer is an associate member of the American Society of Refrigeration Engineers, and is past President of the Golden

Gate Chapter of the Refrigeration Engineers Society.

The appointment of Robert C. Allen, Jr. as Manager of the Kansas City, Missouri, Factory Branch was recently announced by J. F. Ray, Director of Sales.

Mr. Allen will devote his entire time to serving users of automatic pressure, temperature and flow controls in Missouri, Kansas, Eastern Nebraska and Western Idaho.

Mr. Allen was in the Army for 3½ years, spent 27 months overseas with the 9th Air Force as an electrical specialist attached to a squadron of B-26 Marauder bombers.

* * *

ELECTROCHEMICALS APPOINTS S. G. BAKER ASST. GEN. MANAGER

APPOINTMENT of Samuel G. Baker as assistant general manager of the Electrochemicals Department of the Du Pont Company is announced by F. S. MacGregor, general manager. Mr. Baker has been director of the Electroplating Division of the department.

Milton Kutz, who has been acting assistant general manager, becomes a special assistant to Mr. MacGregor.

A native of Tacoma, Wash., Mr. Baker first joined the Du Pont Company as a worker on a powder production line. Later he was graduated from the University of Washington with a degree in chemical engineering and rejoined the Du Pont Company as a chemist in 1925. In the Explosives Department, he served successively in production and sales work and in 1939 he became director of sales of the department. Four years later he joined the Electrochemicals Department as director of the Electroplating Division.

Mr. Kutz's career in the chemical industry began in 1897. That year he joined the Roessler and Hasslacher Chemical Company as an office boy, rising in 33 years to vice-president and a director of the firm.

When Roessler and Hasslacher was acquired by Du Pont in 1930, he became director of sales. In 1933 he was assistant general manager of the department. Illness forced him to take an extended leave of absence in 1941. Since Jan. 1, 1943 he has been acting assistant general manager.

VOLUME INDEX

January to December, 1945 **Volume Thirteen**

TO facilitate the location of articles which have appeared in THE REFRIGERATION SERVICE ENGINEER, this index is a regular feature in each December issue, serving as a ready reference of the articles and subject matter which have appeared in the preceding twelve issues. The figure following the date of issue refers to the page on which the article will be found.

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